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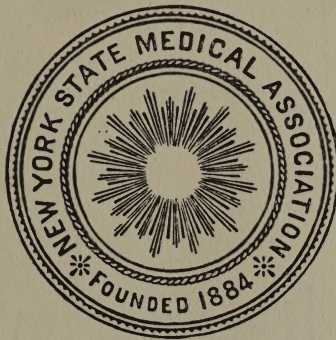
FOR THE YEAR 1895,

*VOLUME XII.*

*EDITED FOR THE ASSOCIATION*

By E. D. FERGUSON, M. D.,

OF RENSSELAER COUNTY.



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## OFFICERS AND COUNCIL FOR 1894-'95.

---

### PRESIDENT.

AUSTIN FLINT, M. D., Fifth District, New York County.

### VICE-PRESIDENTS.

FIRST DISTRICT, D. M. KLOCK, M. D., Montgomery County.

SECOND DISTRICT, W. H. HODGMAN, M. D., Saratoga County.

THIRD DISTRICT, F. W. PUTNAM, M. D., Broome County.

FOURTH DISTRICT, M. W. TOWNSEND, M. D., Genesee County.

### SECRETARY AND TREASURER.

E. D. FERGUSON, M. D., Rensselaer County.

### CHAIRMAN OF THE LIBRARY COMMITTEE.

J. W. S. GOULEY, M. D., New York County.

### MEMBER OF THE COUNCIL AT LARGE.

C. E. DENISON, M. D., New York County.

### ELECTED MEMBERS OF THE COUNCIL.

FIRST DISTRICT, C. H. GLIDDEN, M. D., Herkimer County.

“ “ A. P. DODGE, M. D., Oneida County.

SECOND DISTRICT, THOMAS WILSON, M. D., Columbia County.

“ “ A. T. VAN VRANKEN, M. D., Albany County.

THIRD DISTRICT, F. G. SEAMAN, M. D., Seneca County.

“ “ L. J. BROOKS, M. D., Chenango County.

FOURTH DISTRICT, GEORGE W. GOLER, M. D., Monroe County.

“ “ C. G. STOCKTON, M. D., Erie County.

FIFTH DISTRICT, JOHN D. TRUAX, M. D., New York County.

“ “ JOSEPH D. BRYANT, M. D., New York County.

## COMMITTEE OF ARRANGEMENTS FOR 1894-'95.

---

AUSTIN FLINT, PRESIDENT.

E. D. FERGUSON, SECRETARY.

*Ex-Officio Members of the Committee.*

---

CHARLES E. DENISON, *Chairman.*

JAMES C. MACKENZIE, *Secretary.*

JOSEPH D. BRYANT.

JOHN W. S. GOULEY.

JOHN G. TRUAX.

## OFFICERS AND COUNCIL FOR 1895-'96.

*The Twelfth Annual Meeting will be held at the Mott Memorial Library, in New York City, on October 13, 14, and 15, 1896.*

---

### PRESIDENT.

DARWIN COLVIN, M. D., Clyde, Wayne County.

### VICE-PRESIDENTS.

FIRST DISTRICT, C. H. GLIDDEN, M. D.,  
Little Falls, Herkimer County.

SECOND DISTRICT, THOMAS WILSON, M. D.,  
Claverack, Columbia County.

THIRD DISTRICT, F. G. SEAMAN, M. D.,  
Seneca Falls, Seneca County.

FIFTH DISTRICT, J. R. VANDERVEER, M. D.,  
Monroe, Orange County.

### SECRETARY AND TREASURER.

E. D. FERGUSON, M. D., Troy, Rensselaer County.

### CHAIRMAN OF THE LIBRARY COMMITTEE.

J. W. S. GOULEY, M. D., 324 Madison Ave.,  
New York, New York County.

### MEMBER OF THE COUNCIL AT LARGE.

AUSTIN FLINT, M. D., 60 E. 34th St.,  
New York, New York County.

### ELECTED MEMBERS OF THE COUNCIL.

FIRST DISTRICT, A. P. DODGE, M. D.,  
Oneida Castle, Oneida County; term expires 1896.

“ W. H. ROBB, M. D.,  
Amsterdam, Montgomery County; term expires 1897



- SECOND DISTRICT, A. T. VAN VRANKEN, M. D.,  
West Troy, Albany County ; term expires 1896.  
“ “ GEORGE E. McDONALD, M. D.,  
Schenectady, Schenectady County ; term expires 1897.
- THIRD DISTRICT, L. J. BROOKS, M. D.,  
Norwich, Chenango County ; term expires 1896.  
“ “ W. L. AYER, M. D.,  
Owego, Tioga County ; term expires 1897.
- FOURTH DISTRICT, C. G. STOCKTON, M. D.,  
436 Franklin St., Buffalo, Erie County ; term expires 1896.  
“ DISTRICT, E. M. MOORE, JR., M. D.,  
Rochester, Monroe County ; term expires 1897.
- FIFTH DISTRICT, JOSEPH D. BRYANT, M. D.,  
54 W. 36th St., New York, New York County ; term expires 1896.
- FIFTH DISTRICT, JOHN D. TRUAX, M. D.,  
17 E. 127th St., New York, New York County ; term expires 1897.

## OFFICERS OF THE BRANCH ASSOCIATIONS FOR 1896.

---

### FIRST OR NORTHERN BRANCH.

*The Twelfth Annual Meeting will be held as appointed by the  
President.*

#### OFFICERS.

PRESIDENT, C. H. GLIDDEN, M. D.,  
Little Falls, Herkimer County.  
SECRETARY, \*EZRA GRAVES, M. D.,  
Amsterdam, Montgomery County.

#### EXECUTIVE COMMITTEE.

\*WILLIAM GILLIS, M. D., Fort Covington, Franklin County.  
ISAAC DE ZOUCHE, M. D., Gloversville, Fulton County.  
THOMAS MCGANN, M. D., Wells, Hamilton County.  
W. D. GARLOCK, M. D., Little Falls, Herkimer County.  
J. MORTIMER CRAWE, M. D., Watertown, Jefferson County.  
ALBERT A. JOSLIN, M. D., Martinsburg, Lewis County.  
N. A. CALDWELL, M. D., Hageman's Mills, Montgomery County.  
G. ALDER BLUMER, M. D., Utica, Oneida County.  
E. F. MARSH, M. D., Fulton, Oswego County.  
GUY REUBEN COOK, M. D., Louisville, St. Lawrence County.

---

### SECOND OR EASTERN BRANCH.

*The Twelfth Annual Meeting will be held at Schenectady, Sche-  
nectady County, on the fourth Thursday in June, 1896.*

#### OFFICERS.

PRESIDENT, THOMAS WILSON, M. D.,  
Claverack, Columbia County.  
SECRETARY, JOSEPH E. BAYNES, M. D.,  
Troy, Rensselaer County.

\* Deceased.

## EXECUTIVE COMMITTEE.

W. B. SABIN, M. D., West Troy, Albany County.  
E. M. LYON, M. D., Plattsburgh, Clinton County.  
J. T. WHEELER, M. D., Chatham, Columbia County.  
C. A. CHURCH, M. D., Bloomingdale, Essex County.  
GEORGE CONKLING, M. D., Durham, Greene County.  
F. J. TOMPKINS, M. D., Lansingburgh, Rensselaer County.  
F. F. GOW, M. D., Schuylerville, Saratoga County.  
CHARLES HAMMER, M. D., Schenectady, Schenectady County.  
H. F. KINGSLEY, M. D., Schoharie, Schoharie County.  
D. J. FITZGERALD, M. D., Glens Falls, Warren County.  
JOHN LAMBERT, M. D., Salem, Washington County.

---

## THIRD OR CENTRAL BRANCH.

*The Twelfth Annual Meeting will be held at Auburn, Cayuga County, on the Third Thursday in May, 1896.*

## OFFICERS.

PRESIDENT, F. G. SEAMAN, M. D., Seneca Falls, Seneca County.  
SECRETARY,

## EXECUTIVE COMMITTEE.

J. G. ORTON, M. D., Binghamton, Broome County.  
W. R. LAIRD, M. D., Auburn, Cayuga County.  
F. W. ROSS, M. D., Elmira, Chemung County.  
L. D. BROOKS, M. D., Norwich, Chenango County.  
H. O. JEWETT, M. D., Cortland, Cortland County.  
W. B. MORROW, M. D., Walton, Delaware County.  
M. CAVANA, M. D., Oneida, Madison County.  
ELY VAN DE WARKER, M. D., Syracuse, Onondaga County.  
JOSHUA J. SWEET, M. D., Unadilla, Otsego County.  
B. T. SMELZER, M. D., Havana, Schuyler County.  
F. G. SEAMAN, M. D., Seneca Falls, Seneca County.  
W. L. AYER, M. D., Owego, Tioga County.  
CHAUNCEY P. BIGGS, M. D., Ithaca, Tompkins County.

FOURTH OR WESTERN BRANCH.

*The Twelfth Annual Meeting will be held at Buffalo, Erie County,  
on the second Tuesday in May, 1896.*

OFFICERS.

PRESIDENT, DARWIN COLVIN, M. D., Clyde, Wayne County.  
SECRETARY, WM. H. THORNTON, M. D.,  
570 Niagara St., Buffalo, Erie County.

EXECUTIVE COMMITTEE.

B. C. WAKELY, M. D., Angelica, Alleghany County.  
O. A. TOMPKINS, M. D., East Randolph, Cattaraugus County.  
R. T. ROLPH, M. D., Fredonia, Chautauqua County.  
CHARLES A. WALL, M. D., Buffalo, Erie County.  
FRANK L. STONE, M. D., LeRoy, Genesee County.  
R. J. MENZIE, M. D., Caledonia, Livingston County.  
G. W. GOLER, M. D., Rochester, Monroe County.  
W. Q. HUGGINS, M. D., Lockport, Niagara County.  
F. D. VANDERHOOF, M. D., Phelps, Ontario County.  
JOHN H. TAYLOR, M. D., Holley, Orleans County.  
C. G. HUBBARD, M. D., Hornellsville, Steuben County.  
DARWIN COLVIN, M. D., Clyde, Wayne County.  
A. G. ELLINWOOD, M. D., Attica, Wyoming County.  
WILLIAM OLIVER, M. D., Penn Yan, Yates County.

---

FIFTH OR SOUTHERN BRANCH.

*The Twelfth Annual Meeting will be held in Brooklyn, Kings  
County, on the fourth Tuesday in May, 1896.*

OFFICERS.

PRESIDENT, J. R. VANDERVEER, M. D., Monroe, Orange County.  
SECRETARY, E. H. SQUIBB, M. D.,  
P. O. Box 760, Brooklyn, Kings County.



*NEW YORK STATE MEDICAL ASSOCIATION.*

EXECUTIVE COMMITTEE.

- T. J. BARTON, M. D., Tivoli, Dutchess County.  
R. M. WYCKOFF, M. D., Brooklyn, Kings County.  
A. D. RUGGLES, M. D., New York, New York County.  
M. C. CONNER, M. D., Middletown, Orange County.  
G. W. MURDOCK, M. D., Cold Spring, Putnam County.  
E. G. RAVE, M. D., Hicksville, Queens County.  
H. C. JOHNSTON, M. D., New Brighton, Richmond County.  
WALTER LINDSAY, M. D., Huntington, Suffolk County.  
C. W. PIPER, M. D., Wurtsborough, Sullivan County.  
H. VAN HOEVENBERG, M. D., Kingston, Ulster County.  
H. E. SCHMID, M. D., Tarrytown, Westchester County.



LIST OF PRESIDENTS AND VICE-PRESIDENTS  
FROM THE FOUNDING OF THE ASSOCIATION.

---

1884.

PRESIDENT.

HENRY D. DIDAMA, M. D., Onondaga County, Third District.

VICE-PRESIDENTS.

FIRST DISTRICT, J. MORTIMER CRAWE, M. D., Jefferson County.

SECOND DISTRICT, TABOR B. REYNOLDS, M. D., Saratoga County.

FOURTH DISTRICT, B. L. HOVEY, M. D., Monroe County.

FIFTH DISTRICT, \*N. C. HUSTED, M. D., Westchester County.

---

1885.

PRESIDENT.

\*JOHN P. GRAY, M. D., Oneida County, First District.

VICE-PRESIDENTS.

SECOND DISTRICT, W. H. ROBB, M. D., Montgomery County.

THIRD DISTRICT, JOHN G. ORTON, M. D., Broome County.

FOURTH DISTRICT, JOSEPH C. GREENE, M. D., Erie County.

FIFTH DISTRICT, \*J. C. HUTCHINSON, M. D., Kings County.

---

1886.

PRESIDENT.

E. M. MOORE, M. D., Monroe County, Fourth District.

\*Deceased.

## VICE-PRESIDENTS.

FIRST DISTRICT, \*WILLIAM GILLIS, M. D., Franklin County.  
SECOND DISTRICT, H. C. VAN ZANDT, M. D., Schenectady County.  
THIRD DISTRICT, \*FREDERICK HYDE, M. D., Cortland County.  
FIFTH DISTRICT, \*J. G. PORTEOUS, M. D., Dutchess County.

---

1887.

## PRESIDENT.

\*ISAAC E. TAYLOR, M. D., New York County, Fifth District.

## VICE-PRESIDENTS.

FIRST DISTRICT, JOHN P. SHARER, M. D., Herkimer County.  
SECOND DISTRICT, L. C. DODGE, M. D., Clinton County.  
THIRD DISTRICT, \*GEORGE W. AVERY, M. D., Chenango County.  
FOURTH DISTRICT, DARWIN COLVIN, M. D., Wayne County.

---

1888.

## PRESIDENT.

JOHN CRONYN, M. D., Erie County, Fourth District.

## VICE-PRESIDENTS.

FIRST DISTRICT, BYRON DE.WITT, M. D., Oswego County.  
SECOND DISTRICT, ROBERT SELDEN, M. D., Greene County.  
THIRD DISTRICT, CHARLES W. BROWN, M. D., Chemung County.  
FIFTH DISTRICT, EDWIN BARNES, M. D., Dutchess County.

---

1889.

## PRESIDENT.

WILLIAM T. LUSK, M. D., New York County, Fifth District.

\*Deceased.

VICE-PRESIDENTS.

FIRST DISTRICT, S. H. FRENCH, M. D., Montgomery County.

SECOND DISTRICT, \*R. C. McEWEN, M. D., Saratoga County.

THIRD DISTRICT, ELIAS LESTER, M. D., Seneca County.

FOURTH DISTRICT, T. D. STRONG, M. D., Chautauqua County.

---

1890.

PRESIDENT.

JOHN G. ORTON, M. D., Broome County, Third District.

VICE-PRESIDENTS.

FIRST DISTRICT, DOUGLAS AYRES, M. D., Montgomery County.

SECOND DISTRICT, \*M. H. BURTON, M. D., Rensselaer County.

FOURTH DISTRICT, E. M. MOORE, JR., M. D., Monroe County.

FIFTH DISTRICT, WILLIAM McCOLLOM, M. D. (vice WILLIAM  
B. EAGER, M. D., deceased), Kings County.

---

1891.

PRESIDENT.

STEPHEN SMITH, M. D., New York County, Fifth District.

VICE-PRESIDENTS.

FIRST DISTRICT, DOUGLAS AYRES, M. D., Montgomery County.

SECOND DISTRICT, A. T. VAN VRANKEN, M. D., Albany County.

THIRD DISTRICT, J. D. TRIPP, M. D., Cayuga County.

FOURTH DISTRICT, R. J. MENZIE, M. D., Livingston County.

---

1892.

PRESIDENT.

JUDSON B. ANDREWS, M. D., Erie County, Fourth District.

\* Deceased.



VICE-PRESIDENTS.

FIRST DISTRICT, W. D. GARLOCK, M. D., Herkimer County.

SECOND DISTRICT, G. E. McDONALD, M. D., Schenectady County.

THIRD DISTRICT, LEROY J. BROOKS, M. D., Chenango County.

FIFTH DISTRICT, H. VAN HOEVENBERG, M. D., Ulster County.

---

1893.

PRESIDENT.

S. B. W. McLEOD, M. D., New York County, Fifth District.

VICE-PRESIDENTS.

FIRST DISTRICT, R. N. COOLEY, M. D., Oswego County.

SECOND DISTRICT, J. C. HANNAN, M. D., Rensselaer County.

THIRD DISTRICT, N. JACOBSON, M. D., Onondaga County.

FOURTH DISTRICT, Z. J. LUSK, M. D., Wyoming County.

---

1894.

PRESIDENT.

THOS. D. STRONG, M. D., Chautauqua County, Fourth District.

VICE-PRESIDENTS.

FIRST DISTRICT, ISAAC DE ZOUCHE, M. D., Fulton County.

SECOND DISTRICT, J. C. BENHAM, M. D., Columbia County.

THIRD DISTRICT, HOMER O. JEWETT, M. D., Cortland County.

FIFTH DISTRICT, J. D. RUSHMORE, M. D., Kings County.

---

1895.

PRESIDENT.

AUSTIN FLINT, M. D., New York County, Fifth District.

VICE-PRESIDENTS.

FIRST DISTRICT, DANIEL KLOCK, M. D., Montgomery County.

SECOND DISTRICT, W. H. HODGMAN, M. D., Saratoga County.

THIRD DISTRICT, F. W. PUTNAM, M. D., Broome County.

FOURTH DISTRICT, M. W. TOWNSEND, M. D., Genesee County.



## LIST OF FELLOWS REGISTERED AT TWELFTH ANNUAL MEETING IN NEW YORK CITY.

*Held October 15, 16, and 17, 1895.*

---

### FIRST DISTRICT.

#### HERKIMER COUNTY.

Glidden, C. H., Little Falls.      Sharer, John P., Little Falls.

#### MONTGOMERY COUNTY.

Ayres, Douglas, Fort Plain.      Klock, C. M., St. Johnsville.  
Johnson, R. G., Amsterdam.      Robb, W. H., Amsterdam.

#### ONEIDA COUNTY.

Dodge, A. P., Oneida Castle.

---

### SECOND DISTRICT.

#### ALBANY COUNTY.

Van Vranken, A. T., West Troy.

#### CLINTON COUNTY.

Lyon, E. M., Plattsburgh.

#### GREENE COUNTY.

Selden, Robert, Catskill.

#### RENSSELAER COUNTY.

Ferguson, E. D., Troy.      Hannan, J. C., Hoosick Falls.

#### SCHENECTADY COUNTY.

McDonald, Geo. E., Schenectady.

THIRD DISTRICT.

BROOME COUNTY.

Greene, C. W., Binghamton.      White, Wm. A., Binghamton.  
Putnam, F. W., Binghamton.

CORTLAND COUNTY.

Jewett, H. O., Cortland.

ONONDAGA COUNTY.

Didama, H. D., Syracuse.

OTSEGO COUNTY.

Leaning, J. K., Cooperstown.

SENECA COUNTY.

Clark, Geo. W., Waterloo.      Seaman, Frank G., Seneca Falls.

---

FOURTH DISTRICT.

ERIE COUNTY.

Cooke, A. H., Buffalo.      Stockton, C. G., Buffalo.  
Jones, Allen A., Buffalo.      Thornton, W. H., Buffalo.

GENESEE COUNTY.

Andrews, L. B., Byron.

WAYNE COUNTY.

Colvin, Darwin, Clyde.

WYOMING COUNTY.

Lusk, Z. J., Warsaw.

FIFTH DISTRICT.

DUTCHESS COUNTY.

Barnes, E., Pleasant Plains.	Van Etten, C. S., Rhinebeck.
Bayley, G. C., Poughkeepsie.	Van Wyck, R. C., Hopewell Junc.
LeRoy, I. D., Pleasant Valley.	

KINGS COUNTY.

Bierwirth, J. C., Brooklyn.	Minard, E. J. C., Brooklyn.
Biggam, W. H., Brooklyn.	North, Nelson L., Brooklyn.
Brundage, A. H., Brooklyn.	Squibb, E. H., Brooklyn.
Coffin, Lawrence, Brooklyn.	Squibb, E. R., Brooklyn.
Leighton, N. W., Brooklyn.	Steinke, H. C. O., Brooklyn.
Lloyd, T. M., Brooklyn.	Sullivan, J. D., Brooklyn.
McCollom, Wm., Brooklyn.	Wieber, George, Brooklyn.

NEW YORK COUNTY.

Arnold, Glover C., New York.	Lockwood, C. E., New York.
Baldwin, F. A., New York.	Ludlow, O. C., New York.
Bryant, J. D., New York.	Lukens, Anna, New York.
Bull, C. S., New York.	Lusk, W. T., New York.
Davis, J. G., New York.	Lynch, P. J., New York.
Delphoy, E. V., New York.	Mackenzie, J. C., New York.
Denison, C. E., New York.	Manley, T. H., New York.
Denison, E., New York.	McAlpin, D. Hunter, New York.
Dennis, F. S., New York.	McLeod, Johnston, New York.
Dudley, C. Palmer, New York.	McLeod, S. B. W., New York.
Dunham, E. K., New York.	Milliken, S. E., New York.
Einhorn, Max, New York.	Moran, James, New York.
Eliot, Ellsworth, New York.	Newman, Robert, New York.
Flint, Austin, New York.	O'Brien, M. C., New York.
Flint, Austin, Jr., New York.	Oppenheimer, S., New York.
Gouley, J. W. S., New York.	Painter, H. McM., New York.
Harrison, G. T., New York.	Phelps, Charles, New York.
Haubold, H. A., New York.	Potter, E. Styles, New York.
Hepburn, N. J., New York.	Purple, S. S., New York.
Holmes, M. C., New York.	Ruggles, A. D., New York.
Judson, A. B., New York.	Sayre, Lewis A., New York.
Leale, C. A., New York.	Sayre, R. H., New York.





## DELEGATES FROM OTHER MEDICAL ORGANIZATIONS IN ATTENDANCE.

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### CONNECTICUT.

W. H. CARMALT, M. D., NEW HAVEN.	.	.	.	Delegate.
FREDERICK T. SIMPSON, M. D., HARTFORD.	.	.	.	Delegate.
J. R. TOPPING, M. D., BRIDGEPORT.	.	.	.	Delegate.

### KINGS COUNTY ASSOCIATION.

ARTHUR C. BRUSH, M. D., BROOKLYN.	.	.	.	Delegate.
JOHN O. POLAK, M. D., BROOKLYN.	.	.	.	Delegate.

### NEW YORK COUNTY ASSOCIATION.

GESSNER HARRISON, M. D., NEW YORK.	.	.	.	Delegate.
THOMAS H. HOLGATE, M. D., NEW YORK.	.	.	.	Delegate.
JAMES C. LAY, M. D., NEW YORK.	.	.	.	Delegate.
THEODORE H. NEWLAND, M. D., NEW YORK.	.	.	.	Delegate.
EVEREST W. RUSSELL, M. D., NEW YORK.	.	.	.	Delegate.
DOUGLAS H. STEWART, M. D., NEW YORK.	.	.	.	Delegate.
ALFRED B. TUCKER, M. D., NEW YORK.	.	.	.	Delegate.
Z. SWIFT WEBB, M. D., NEW YORK.	.	.	.	Delegate.
N. S. WESTCOTT, M. D., NEW YORK.	.	.	.	Delegate.

## ADDRESS OF WELCOME AND REPORT OF THE COMMITTEE OF ARRANGEMENTS.

By CHARLES E. DENISON, M. D., of New York County, Chairman of  
the Committee.

*October 15, 1895.*

GENTLEMEN: The Committee of Arrangements, in the name of the Fellows of New York county, have the pleasure of giving you a hearty welcome to the twelfth annual meeting of the New York State Medical Association.

Believing you will be best served by immediately proceeding to the work at hand, a brief outline of the arrangements made for your entertainment and instruction has been prepared.

The programme, which was mailed to each Fellow of the Association, contains an address on the scientific treatment in criminology; an address on the present status of obstetrics; an address on the practise of medicine in its relation to bacteriology; a surgical discussion on malignant tumors; a continuation of the discussion on the prevention of tuberculosis; later facts of studies on diphtheria and pseudo-diphtheria; and many other valuable papers.

The five districts of the state have contributed scientific papers in the following proportions:

First District	.	.	.	.	.	.	.	.	1
Second "	.	.	.	.	.	.	.	.	2
Third "	.	.	.	.	.	.	.	.	4
Fourth "	.	.	.	.	.	.	.	.	4
Fifth "	.	.	.	.	.	.	.	.	36

In the sixty counties of the state, Fellows of the Association from twelve counties have contributed as follows:

Third District,	Broome County	.	.	.	.	.	1
"	"	Chenango	"	.	.	.	1
Fifth	"	Dutchess	"	.	.	.	1
Fourth	"	Erie	"	.	.	.	3
Fifth	"	Kings	"	.	.	.	2
First	"	Montgomery County	.	.	.	.	1
Fifth	"	New York	"	.	.	.	33
Third	"	Onondaga	"	.	.	.	1
Second	"	Rensselaer	"	.	.	.	1
"	"	Schenectady	"	.	.	.	1
Third	"	Schuyler	"	.	.	.	1
Fourth	"	Wyoming	"	.	.	.	1
							<hr/>
							47

In accordance with the subject-matter the papers are classified as follows:

20	are on	General Surgery.
9	"	" Medicine.
2	"	Therapeutics and Materia Medica.
4	"	Gynaecology.
2	"	Bacteriology.
3	"	Ophthalmology.
2	"	Insanity.
2	"	Obstetrics.
2	"	Criminology.
1	is not	stated.

The following changes and additions are to be made in the official programme:

On page 6, No. 14, line 7, change D. D. S. to M. D.

Dr. S. E. Milliken, of New York county, will read a paper on "Excision of the Elbow Joint for Tubercular Disease in Children, with Report of a Case in which Motion was Restored."



Dr. William McCollom, of Kings county, will read a paper on "Criminal Abortion."

Dr. William H. Robb, of Montgomery county, will read a paper on "A Cause of Much Sickness that is Often Overlooked."

The Committee extend a cordial invitation to all Fellows of the Association, and to all visitors and delegates from sister associations, to the collation on Wednesday evening.

THE PRESIDENT'S ANNUAL ADDRESS.—THE  
COMING ROLE OF THE MEDICAL PRO-  
FESSION IN THE SCIENTIFIC TREAT-  
MENT OF CRIME AND CRIMINALS.

By AUSTIN FLINT, M. D., of New York County.

*October 16, 1895.*

Dr. Cesare Lombroso, in his work on "The Applications of Criminal Anthropology," quotes Rondeau as saying, in an essay on the death penalty:

"Even assassins are patients, as well as all other criminals. They should be punished because they disturb the regular course of social life, because they are obstacles to the development of the species.

"Conceding that every crime is the natural outcome and a logical consequence of some disease, its penalty should be nothing else than a medical treatment."

The idea which underlies the view of Rondeau is that moral liberty has no existence, and that a moral evil is the result of physical fault. "In his system of repression all prisons would be transformed into hospitals; no attempt would be made to improve the organisation of convicts. The thief and the vagabond would be treated by making them taste the joys of work, and in secluding for life those inaccessible to all treatment."

Society, I venture to say, is hardly prepared to accept the logical consequences of these views; but it must be admitted that the treatment of crime and criminals, under existing laws and their methods of execution, is a failure, and a failure so serious in its results that it is difficult to imagine what will occur before a revolution takes place and scientific criminology and penology become established as part of the social fabric.

It has been stated on competent authority that crime in Great Britain is responsible for an annual public expenditure of ten millions of pounds sterling. "According to a recent report to the Ohio Board of State Charities, the citizens of the United States spend an annual sum of fifty-nine million dollars on judiciary, police, prisons, and reformatories." The president of the National Prison Congress of the United States says:

"Other questions which agitate the public and divide parties are doubtless important; but the country can live and prosper under free trade and protection, under bimetalism or monometallism, under Democracy or Republicanism, but it cannot survive a demoralised people with crime in the ascendant. That crime is on the increase out of proportion to the population is indicated in many ways, but for the country as a whole the United States census is the most reliable guide. Let us look at it by decades:

	Prisoners.	Ratio to population.
1850.....	6,737	1 in 3,442
1860.....	19,086	1 in 1,647
1870.....	32,901	1 in 1,171
1880.....	58,609	1 in 855
1890.....	82,329	1 in 757 "

In Great Britain, Germany, France, Italy, and other civilised countries, the penal systems do not differ very materially from ours; and we may assume that in these countries crime is not more successfully treated. What wonder is it, then, that jurists who have studied this great question, like von Liszt, of Germany, "admit that our existing penal systems are powerless against crime"!

The chief object of a penal system is the protection of society. The facts that I have just cited show that the protection of society against crime and criminals is becoming more and more alarmingly inefficient.

The statements and statistics just given have not been exhumed from obscure sources. They are taken from Morison's introduction to "The Female Offender," by Lombroso

and Ferrero, recently republished in New York and extensively circulated. Without considering the merits of this book in the form of its mutilated and imperfect translation, in which it seems hardly worthy of the distinguished reputation of Lombroso, the statistics alone, given in the introduction, should awaken the public to the necessity of a radical reform in penal methods and the danger of delay.

Sentimentality in questions of criminology and penology should be put aside. It has no more place in criminal law and penal administration than in medicine and surgery. Crime is a disease of our social organisation. It is true that it is ineradicable, but it may be restricted within much narrower limits than at present exist. Crime calls for intelligent and scientific treatment. While crime cannot be abolished, all criminals are not hopelessly affected with crime. Individuals may be protected against crime as Jenner has protected individuals against small-pox. Crime may be a constitutional disease, as in the born criminal, or it may be due, in individual cases, to surroundings, teaching, or example—a sort of contagion. It has been abundantly shown that criminals may be divided into two great classes, the curable and the incurable; but the disease which we call crime has nearly as many phases and varieties as are presented by the nosological catalogue. Society needs the aid of competent men to undertake the task of separating the curable from the incurable, to restore the former to usefulness and to protect our social organisation against the latter. Jurists, so-called law-givers, and those who execute the laws have failed. In my opinion, the only hope is in the medical profession. This is the explanation I have to give of bringing the subject of crime before the Association. I have lately become fully sensible of the immense extent and importance of the subject in its relations to the profession, and, more than all, of my deficiencies in study and experience in the questions involved; but no problem can come before us more worthy of thorough investigation and careful consideration. I venture to recommend and hope



that in a future meeting or meetings the Association may make this matter the subject of formal discussion, and attempt to devise something to meet in a measure the existing and pressing necessity for reform.

It is to be feared that the medical profession can have little direct influence in the making or repeal of laws. The past does not show any encouraging success in this direction. The protection of the community against so dangerous and evident an evil as the unrestricted sale of patent medicines of unknown composition, many containing powerful and deleterious drugs, has never been accomplished. The profession has found itself powerless against the immense pecuniary interests involved in the sale of secret remedies, and has not been able even to compel the disclosure of the composition of these preparations, so that the public might know what it is buying. How little, then, can we hope to do in the way of enacting intelligent penal laws, or of repealing bad laws that have been handed down from antiquity! Our chief hope at present is to induce judges, lawyers, and law-makers to study law in the light of modern scientific knowledge.

The existing system of criminal law is based upon the ancient idea of vengeance and retaliation in the form of what is known as punishment. Crimes that are not criminal and offenses that do not offend are created every year by legislative bodies, as well as laws which restrict the liberty of certain classes, giving special privileges to others. Police organisations, whose duty it is to preserve rights, order, cleanliness, health, etc., and who are "for the enforcement of the laws and the prevention of crime," often induce, by fraud and deceit, men to commit so-called crimes so that they may be punished therefor. Does not this tend to increase the number of enemies of society, who are already so numerous and threatening? Are the real offenses against the good order and happiness of the people so easily repressed that we can afford to create new and artificial crimes by statute?

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In its application to the treatment of crime and criminals, the idea of the word law, in the minds of jurists and legislators, needs revision. In its strict and scientific sense, the word law means something that is laid, fixed, or set. A law is something that exists, has existed from the beginning, and the mind of man can not conceive that it will ever cease to exist. Man can neither make, destroy, nor modify a law any more than he can create or annihilate an atom of matter. Laws, when known, have been discovered by man, not created. The laws of gravitation, of the correlation and conservation of forces, of certain diseases, and, the most terrible and inexorable of all, the law of heredity and atavism, have been discovered by illustrious searchers after truth. Man may modify the working of certain natural laws, but the laws themselves remain fixed and immutable. The universe, animate and inanimate, including man, exists and progresses in accordance with laws, known and unknown. Man is subject to psychical as well as physical laws, and no human act is without a cause, immediate or remote. In a so-called legal sense and in its relations to social organisation, law may be termed formulated equity and applied justice; but, in the words of Blackstone, "No human laws are of any validity if contrary to the law of Nature, and such of them as are valid derive all their force and all their authority, mediately or immediately, from this original."

Man is a gregarious animal. An outcome of the development of intelligence and knowledge is social organisation. This is in accordance with a law of Nature, and it involves the necessity of ordinances and regulations for the protection and preservation of communities. When these ordinances and regulations are inequitable and unjust, there is immediate dissatisfaction, and rebellion sooner or later. When the natural laws of what may be called man's physical organisation have been violated, either in the individual or in his ancestry, the result is disease. A man may suffer for the faults of his own organism, or from infection or from contagion. It is the province of the physician to endeavour

to cure the disease of an individual, or care for him during its progress, so that he may be restored to health, and to protect individuals and communities against infection and contagion, thus preventing disease. Physicians have learned how to cure certain diseases; by the applications of sanitary science and quarantine they protect communities against certain diseases; recent discoveries have enabled them to secure immunity from certain diseases. In the future, carrying out recent researches in psychological medicine, physicians will be largely instrumental in the treatment of moral disease. It is to the physician that society will look for the differential diagnosis between the curable and the incurable criminal. Scientific progress will lead us finally to abandon the ancient idea of punishment of crime, and to substitute for it, treatment and correction. The only punishments will be those necessary for the enforcement of discipline in prisons and elsewhere. The treatment of criminals will resolve itself into measures to reform the curable and to protect society against the incurable.

A necessary preliminary to the intelligent treatment of any disease is diagnosis; and this, which is one of the fundamental principles of the science of medicine, is logically applicable to moral as well as to physical or mental disease. It is universally recognised that the insane are not responsible for their acts to the extent of deserving punishment. The organisation of society demands that there be protection against the harmful acts of the insane, and the dictates of humanity call for the protection of the insane against himself. It may fairly be assumed that no mental disturbance taking the form of insanity is without a physical cause, however obscure this cause may be. Is it possible that every moral delinquency has a physical cause? It is certain that nearly every confirmed and incurable criminal has a special leaning toward a certain class of crimes. Is there a physical vice or defect which leads to the commission of these crimes, when conditions are favourable to the full development of this vice and to its expression in criminal acts? These are

questions that are occupying the minds of criminologists of the present day.

It is often said that the border line between insanity and crime is very narrow and indefinite. The plea of insanity, which is so often presented in extenuation of certain crimes, the irresistible impulse which some insane persons have to commit certain crimes—such as homicide, suicide, stealing, arson, etc.—would seem to show that insanity, in some of its phases, readily fades into criminality, or that criminality may be the first manifestation of insanity. Nothing illustrates this idea more strongly than the distinctions that have been drawn between criminality and so-called moral insanity.

To my mind, it should not often be difficult to distinguish between criminality and insanity, provided the data from which to draw a conclusion be full and sufficient. There are the criminal insane and the insane criminal; the one, an insane person who commits crime under an insane impulse; the other, simply a criminal who has become insane. It might be difficult to fix the responsibility of the insane criminal if it were impossible to determine the time when he became insane; but there should be little difficulty in making a diagnosis of the criminal insane. Other difficulties may also present themselves: An outburst of insanity, made evident by a palpably insane act, under the influence of what seems to be a sudden impulse or a recent delusion, has probably been preceded by a delusion or delusions carefully concealed. A criminal act, without insanity, may be discovered, the criminal having, during a long period of years, sedulously maintained the appearance of scrupulous honesty, often assuming the cloak of religion. In some cases of this kind, it has been claimed that the person is morally insane and is irresponsible. It has always been found very difficult to show that a person who commits a crime against property, with intelligent efforts at concealment, hoping and endeavouring to reap the advantages of his crime or attempting to escape its consequences by flight, is irresponsible on any theory. A kleptomaniac steals simply because there is



an impulse to steal which he cannot resist. He does not profit by the crime, and has no logical reason for stealing. The criminal, however, always expects and attempts to enjoy a personal advantage as the result of his crime, or he has a reason, which to his criminal mind is logical. The existence of strong temptation, great need or heavy financial burdens, sudden passion which has a logical cause, revenge or hatred engendered by actual injuries or wrongs, afford satisfactory explanations of many crimes, and enable us to determine the question of responsibility. I can hardly bring myself to a belief in the existence of what is called moral insanity, excepting the moral defects which are so often observed in dementia and senility, when certain passions remain and the normal power of self-control is impaired.

To Garofalo is due the credit of indicating differences between the criminal and the insane, which are clearly appreciable with very few exceptions. In the insane, the accomplishment itself of the criminal act is the end and object, and is, in itself, a source of pleasure and satisfaction. In the criminal, the act is done as a means of obtaining a material advantage, and the act itself may be repugnant. It is the abnormal nature of the pleasure and the fact that no other satisfaction is sought for, which characterises the insane and distinguishes him from the criminal.

The classification of criminals is not difficult. Havelock Ellis adopts the classification of Ferri, with slight modifications:

The criminal by passion, as a rule, has no criminal characteristics. He is simply lacking in self-control, and almost invariably experiences remorse. Actually, a criminal from passion is not a criminal, and is not a permanent enemy of society. It is necessary, however, to our social system that he should take the consequences of his criminal acts. He does not commit crimes against property.

The occasional criminal, or the criminal by occasion—the semi-criminal of Lombroso—may properly be regarded as belonging to the criminal class. He may or may not have



an opportunity or undergo temptation to commit crime; but under temptation, and with opportunity, he may commit crime from mere weakness of character. Still, there is no occasional criminal who is without criminal tendencies in a greater or less degree.

Havelock Ellis's distinction between the professional criminal and the instinctive, or the born criminal of Lombroso, seems to me to be artificial. The born criminal almost always presents physical signs of degeneration, and his history often reveals heredity or atavism, his moral criminal characteristics usually being intensified by surroundings. It is thought by some alienists and criminologists that there is often little difference between the born criminal and the victim of so-called moral insanity; but it must be admitted that a born criminal is seldom regarded as insane unless he belongs to the higher classes of society.

The professional criminal may be a born criminal, with physical characteristics, or he may present no physical abnormalities. The high-class professional is always a man of considerable intellectual ability, usually free from small vices and a hard worker. It is pretty generally admitted that a professional criminal past the age of thirty cannot be rescued from criminal life. The professional criminal is, of course, an habitual criminal; but other habitual criminals there are of less ability, whose methods of exercising their vocation do not entitle them to rank with professionals.

We have little or nothing to do, in a scientific way, with the criminal by passion. Sad experience and remorse may teach him a lesson, and lead him to exercise self-control. He must accept the consequences of his criminal acts; but it is our duty, especially toward the young, to provide that he be contaminated as little as possible by surroundings while under control. So it should be with those who offend simply against good order, or who are guilty of what may be termed artificial crimes. It is not a crime to bake or sell bread at prohibited hours, or to violate certain ordinances necessary to public decorum or cleanliness. Many men and

more women can never be made to feel that it is a crime to evade duties on purchases for their own use, yet the laws in this regard must be enforced. So long as legislators continue to enact new so-called criminal laws every year, and officials are compelled to select certain of them to enforce—as it is physically impossible to enforce them all—criminal statistics will never represent the actual detected criminality. Criminality can be studied in a statistical way, only from the reports of courts and prisons; and it would contribute much to the accuracy of our knowledge if we could eliminate all except offenses against natural laws and those which are essential to the integrity of our social system.

In the scientific study of crime, the physician has to do mainly with the occasional criminal, the habitual criminal, and the born criminal; and in this study, the first thing is to separate these from the offender who is not a criminal and the occasional criminal. He will be forced to rely upon the courts for facts in regard to criminal acts. Such and such persons, with such and such an official record, have committed certain offenses; and these persons, on conviction, are turned over to experts for diagnosis and treatment. The ascertainable physical and moral characteristics of the offender may not be useful in the determination of the crime, but they may be very useful in the classification and treatment of the criminal.

The born criminal is seldom without physical evidences of what is now called degeneration. He presents certain physical abnormalities. In fact, according to the notions of Lombroso and his followers, without such abnormalities he is not a born criminal. All of the purely physical characteristics observed in the born criminal are present to some extent in the normal man. Some of those which have been described by Lombroso and others are,—peculiar skull and facial conformations; left-handedness and ambi-dexterity; absence or exaggeration of tendon reflexes; abundant hair on the head, with scanty beard; muscular abnormalities; anaesthesia and analgesia; unusually rapid recovery from

wounds, or "disvulnerability"; obtuse tactile sensibility; unusual acuteness of vision; defects in the sense of hearing, taste, or smell; with many others less marked, and regarded as of less importance. Take, however, individual instances in which even a considerable number of these abnormalities exist. We may have a person with a marked peculiarity in skull formation, a heavy jaw, abundant red hair, scanty beard, diminished knee-jerk, defective sense of contact, acute vision, dull hearing, taste, and smell, some muscular abnormality, and yet this person may pass through life, honest and upright, showing no criminal tendency even when exposed to temptation and favoured by opportunity; but it would be idle to say that, in a person who had committed a crime, physical abnormalities found to be more frequent in the criminal than in the normal man, and particularly frequent in a certain class of criminals, may not be of great value in classifying the criminal, forming an estimate of his dangerous qualities and of the probability of reformation. A person may have the so-called insane ear or strikingly abnormal palate, great irregularities in the development of the teeth, and an insane ancestry, and yet we must wait for positive evidence of insanity by word, deed, or action before he can be pronounced insane. So physical abnormalities, even with criminal ancestry, are never in themselves absolute evidence of criminality.

The weakness in the position that there are any positive physical tests for criminality is two-fold. There is no fixed normal standard of comparison; and the exceptions in which physical peculiarities assumed to be characteristic of criminality exist in normal individuals are very frequent.

On the other hand, the mental and moral characteristics of criminality are fairly positive and definite. Given a number of persons who have committed actual crimes; meaning by this certain offences against the person or against property which are violations of natural laws: These include homicides; all kinds of crime, against property, with or without violence; felonious assaults; malicious injury to

person or property; the aiding and abetting of crime for gain, and other forms of crime which readily suggest themselves. There may be excluded: offenses against good order or discipline, not in themselves criminal; purely social offenses; purely political offenses; honest differences from prevalent opinion on political, social, or religious questions; offenses against laws which restrict the natural rights of man; offenses innocently committed through ignorance, etc. The mental and moral peculiarities or abnormalities of these individuals may well be made use of in diagnosis, classification, and treatment. Taken in connection with these, the purely physical abnormalities become of great importance, as they do in the diagnosis, treatment, and prognosis of insanity.

As I have already said, the criminal by passion alone is a normal man, but deficient in self-control under provocation or strong emotion. He presents no criminal history. The criminal act is followed by the deepest regret and intense remorse, usually with a desire for all possible reparation.

The criminal by occasion, or the one who commits a crime when occasion presents itself in the form of temptation and opportunity, may lack physical and moral characteristics of criminality and have no criminal heredity, being simply of a weak and pliable organisation. This unfortunate should be treated most carefully, and be protected, as far as possible, from influences which may render him an habitual criminal.

The professional and the habitual criminal are the most dangerous enemies to society. Criminals belonging to this class form a criminal organisation ruled by the dominating personality of those of superior intelligence. They may possess few, if any, abnormalities called degenerative; but they have no feelings of remorse, even for the gravest crimes, are social in their habits, not solitary, and use the argot, or conventional language of criminals and vagabonds, which is never employed by the criminal by passion or the criminal by occasion. The professional is usually not cowardly like the born criminal. He is temperate, pru-

dent, without real friendships, and his sexual ties are seldom more than transient and unstable. These aristocrats of the criminal world have talents and industry which, directed in legitimate channels, would command respect. With the professional criminal, crime is profitable. Dugdale, the author of that remarkable study of crime called "The Jukes," says: "We must dispossess ourselves of the idea that crime does not pay." Again he says: "Those who do minor crimes commit about one hundred to one hundred and fifty offenses to *one commitment*, while those who 'go for big money' get caught once out of five times." A great problem is to make crime unprofitable; but this appears to be excessively difficult. The idea of Garofalo is certainly in the right direction. On conviction of a crime against property, strip the criminal of everything necessary to complete restitution; or if no property can be reached, let the hard labour of the convict contribute as far as possible toward that end. As it is, the innocent sufferer finds it more to his advantage to compound a felony than to aid what is called justice; and often he is deprived of his liberty in a house of detention while the criminal is at large on bail.

It is with the born criminal that the medical profession will have most to do; and the scientific study of this abnormality cannot fail to be of immense benefit to our social system. The born criminal always presents certain distinctive mental and moral abnormalities.

Grouping together the professional, the habitual, and the born criminal, the same differences in intelligence and education are found as in the honest walks of life. Those who are of a low degree of intelligence are forced to limit themselves to crimes that are within the scope of their mental capacity. They replace intelligence with a low duplicity and cunning, and they often act under the direction of others. These most frequently present physical evidences of degeneration. Experience in reformatories shows that many are incapable of education or even of learning a trade



which requires a moderate degree of skill. A great proportion of these are incorrigible. While all authorities agree that education in itself is no bar to criminality, it must be admitted that the discipline which is involved in education and the avenues which it opens to honest, remunerative labour are favourable elements in reformation when other conditions render this possible.

The chief defect in education observed in criminals is in the line of technical skill. According to the observations of Dugdale, 79.4 per cent. of the criminals examined had never learned a trade. This observation is confirmed by all students of criminology.

What Havelock Ellis calls moral insensibility is always observed in the born criminal. It is very important to distinguish this from so-called moral insanity. General moral insensibility is a want of appreciation of right and wrong from the criminal's point of view—it may be called perversity or depravity—and criminal acts are not followed by repentance or remorse. Those who are regarded as morally insane have no genuine remorse, and the argument in favour of moral insanity without responsibility is based on the notion that the moral insensibility is confined to a single class of crimes, such as forgery, breach of trust, etc. It is difficult to imagine that a person has a moral defect as regards the crime of forgery, for example, and is entirely honest in other regards. If the idea of monomania is to be discarded by alienists, the idea of moral insanity must also fall. As to the question of monomania, how is it possible that a lunatic shall have a single delusion which his intelligence is incapable of correcting, and yet this intelligence be absolutely normal in all other regards? The mental disease may manifest itself in a single delusion which cannot be concealed; but none the less is it positive proof of mental disease.

The born criminal never has remorse. This is, indeed, pathognomonic of congenital criminality. Bruce Thompson studied this question in four hundred criminals convicted

of premeditated homicide, only three of whom expressed remorse. If it is ascertained positively, after a sufficient period of observation and treatment, that a criminal has no real remorse or repentance, it is certain that we have to do with an incurable born criminal.

The general character and mode of life of habitual criminals are interesting and instructive. Such criminals are invariably vain, superstitious, constitutionally lazy and improvident, and are often sentimental and excitable. They are social with their own kind, prone to orgies and to association with a certain class of prostitutes who have the same kind of moral insensibility. They use among themselves the argot, or conventional criminal language, which is quite different from the ordinary vulgar slang. They are fond of tattooing. Lombroso says: "Among male criminals the practice of tattooing is so common as to become a special characteristic." The high-class professional is certainly an habitual criminal and may be a born criminal; but his habits are usually such as do not interfere with the successful exercise of his profession.

It is impossible in the space at my command to do more than refer to the great questions of atavism, heredity, and environment in their relations to criminality. "The Jukes," that remarkable study by Dugdale, gives an idea of the terrible influence of heredity. The estimates by Dugdale from the facts which he ascertained are certainly reasonable. He calculated that the descendants of one individual, making a family of twelve hundred strong, entailed upon the community during a period of seventy-five years an amount of loss and expense equal to \$1,250,000. If any relief is to be expected from the scourge of the posterity of criminals, it is certainly to the medical profession that society must look.

When the diagnosis of the criminal and his classification is not to be obtained from the criminal's own record, this can be made only in prisons and reformatories. A criminal under thirty years of age on his first conviction is certainly a most interesting subject for study. The result of such

study should class him either as a criminal by passion, a criminal by occasion, a born criminal, or a criminal insane. The only way to afford an opportunity for diagnosis and proper treatment is by the indeterminate sentence. The trial by judge and jury merely fixes the crime and its responsibility; it cannot bring to light the true character of the criminal and indications for his intelligent treatment. Measuring the punishment to the crime is in the spirit of vengeance, which does not belong to man; it breathes no thought of reformation or of intelligent protection of society. In the words of Van Hamel: "The greatest enemy to the new tendency in the treatment of criminals is the doctrine of penal satisfaction, descendant of 'ancient vengeance, which has the pretension to confide to man a task which can only be reposed in the hands of God.'" "It is not enough," says Wines, "that criminal jurisprudence should be humane; it must also be intelligent."

The law has thrown such safeguards around the criminal that many crimes may be committed with impunity, and criminals frequently escape conviction when there is no room for doubt in regard to their guilt. There are, however, few unjust convictions. In the examination of nearly a hundred and fifty convict witnesses in the late investigation of the Elmira Reformatory, not more than one or two hesitated to admit their guilt. Dugdale says: "Of those who are essentially not criminal, who are of sound mind and body, honest and industrious and of good stock, there are among state prison convicts from one to two per cent. They are usually committed for crimes against the person." The conviction of an entirely innocent person of honest antecedents must be of extremely rare occurrence.

On conviction of a criminal he should be turned over to the state for treatment. The judge should not fix the so-called punishment. Fortunately, laws are not wanting in the state of New York to render possible this beginning of an intelligent criminal administration. All will admit the value and saving to society of the reformation of criminals;

and all criminologists, without exception, regard the indeterminate sentence as indispensable to proper reformatory measures. I copy from *The Sun* of August 14, 1895, the following, which shows that judges have the power to impose indeterminate sentences, with very slight restrictions and few exceptions:

“A fact not generally known even among the lawyers who practise in the criminal courts in this city is that the state prison law provides for indeterminate sentences such as are in operation at the Elmira Reformatory. The provision is made in section 74 of the Prison law, which is as follows:

Whenever any male person over sixteen years of age shall be convicted of a felony which is punishable by imprisonment in a state prison for a term to be fixed within certain limits by the court pronouncing sentence, the court authorised to pronounce judgment upon such offender, instead of pronouncing upon such offender a definite sentence of imprisonment in a state prison for a fixed term, may pronounce upon such offender an indeterminate sentence of imprisonment in a state prison for a term with minimum and maximum limits only specified, without fixing a definite term of sentence within such limits named in the sentence, but the maximum limit so specified in the sentence shall not exceed the longest period for which such offender might have been sentenced, and the minimum limit in said sentence specified shall not be less than the shortest term for which such offender might have been sentenced. The maximum term specified in such indeterminate sentence shall be limited in the same manner as a definite sentence in compliance with the provisions of section 697 of the Penal Code.

“Succeeding sections appoint the superintendent of state prisons, the agent and warden, the chaplain, the physician, and the principal keeper of each prison a board of commissioners of paroled prisoners for each prison. They are to meet from time to time, and each prisoner sentenced under the law has a right to appear and apply for his share on parole, or for an absolute discharge. The commission is empowered to grant an absolute discharge where it believes

that the prisoner will live an honest life. When the members of the commission feel a 'reasonable probability' only, they may parole. Other sections provide for the retaking of prisoners who violate their parole at any time before the maximum term for which they might have been sentenced expires. Although the leading penologists of the world advocate the indeterminate sentence system, the judges of the courts do n't seem to take to it. The law has been on the statute books since 1890, and only twenty-eight prisoners have been sentenced under it."

If our judges could be brought to carry out this law, an immense advance would at once be made in the intelligent treatment of criminals. Every prison should include a reformatory, if for nothing else, to separate those who may possibly be reformed from the incorrigible.

The born criminal, when he becomes an habitual criminal, is, and always will be, an enemy of society. He cannot be reformed, but the safety of the community demands that he be kept under constant surveillance when not actually confined. He is not only dangerous to society at large, but his association with the corrigible criminal is a great hindrance to the work of reformation.

The penal code provides for the treatment of the habitual criminal, who was defined by statute in 1881, although the first sentence under the code was pronounced August 29, 1895.

I am indebted to *The Sun* for the following citations:

#### NEW YORK STATE PENAL CODE.

690. *Habitual Criminals*.—Where a person is hereafter convicted of a felony, who has been, before that conviction, convicted in this state of any other crime, or where a person is hereafter convicted of a misdemeanor who has been already five times convicted in this state of a misdemeanor, he may be adjudged by the court, in addition to any other punishment inflicted upon him, to be an habitual criminal.—*Code Cr. Proc.*, sec. 510. *People v. McCarthy*, 45 How., 97.

691. *Person, etc., of Habitual Criminal*.—The person of an



habitual criminal shall be at all times subject to the supervision of every judicial magistrate of the county, and of the supervisors and overseers of the poor of the town where the criminal may be found, to the same extent that a minor is subject to the control of his parent or guardian.—*Code Cr. Proc.*, sec. 514.

692. *Effect of Pardon.*—The governor may grant a pardon which shall relieve from judgment of habitual criminality as from any other sentence; but upon a subsequent conviction for felony of a person so pardoned, a judgment of habitual criminality may be again pronounced on account of the first conviction, notwithstanding such pardon.—*People v. Price*, 53 Hun., 188; 24 N. Y. State Rep., 936.

It is thus seen that existing laws in the state of New York provide for the classification of criminals, the reformation of the corrigible, and protection against the incorrigible. All that is necessary to a practical reform, which must come in the near future, is a judiciary sufficiently enlightened to act in accordance with the provisions for indeterminate sentence and for the surveillance of the habitual criminal, and a prison organisation, intelligent, earnest, and capable of carrying out reforms on scientific principles which are now fairly well established. In the work of criminal administration the physician should occupy a prominent place. In the words of Laurent,—“The physician should be the friend and student of the criminal as he is of the insane; should know how to distinguish the alcoholic, epileptic, insane, the vagabond, and morally insane. The prison may remain a prison, and yet be transformed through the results of criminal anthropology. Prisons are inextinguishable mines for material for investigations in this science.” The United States initiated practically prison reforms, beginning with the House of Refuge (afterward removed to Randall’s Island) in 1825, and culminating in the Elmira Reformatory in 1876; and yet “numbers of prisons exist nowadays which fall far below the commonest requirements of a good prison system.”<sup>1</sup>

<sup>1</sup> Griffiths.

The treatment of criminals is the great social question of the present day. There is no good reason why we should not take advantage of the studies and experience of criminologists and penologists, treating, without malice or resentment, the criminal as a patient as well as crime as a disease; and there is every reason why we should study crime in our prisons in the same spirit in which we study disease in our hospitals and insanity in our asylums. The objects to be kept in view are the cure of the curable by reformation, protection against the incurable, prevention in the way of limiting the development of criminal tendencies in the young, and deterring those in whom these tendencies have become developed. Punishment, as retribution for crime, has no place in this system. Punishment, except as it deters, is of no advantage to society. The spirit of revenge which leads an individual to kill or injure one who has wronged him has no place in the legal protection of members of our social system. What leads so many good citizens to condone crimes against property, if they can secure any degree of restitution, is the fact that it is of no advantage to the injured that the criminal be punished, to a certain extent at his expense and inconvenience. Punishment, however, is a necessary element of discipline, and nowhere is discipline more important than in reformatories and prisons.

The reformatory treatment of criminals is that which appeals most strongly to us as members of a profession whose mission is to alleviate suffering and preserve health and life. We do not ask, Is it worth while to attempt to reform criminals? but simply, Can they be reformed? On this question I can speak with the advantage of some experience.

In 1894 I had the honour to be a member of a commission of investigation of the New York State Reformatory at Elmira. This investigation continued for about six months, and during that time I made a careful study of the methods of the institution and the results obtained. These results are most striking and encouraging to those interested in

prison reform. The system—which time does not permit me to fully describe—involves discharge on parole after a certain period of treatment. It is estimated—and the estimate seems fair—that out of 3,725 paroled from 1876 to September 30, 1893, 3,051 were reformed, or 81.9 per cent. Out of 4,797 indefinites discharged, “whether by parole, expiration of maximum term, or any other way, the percentage of reformations was 63.6.” These calculations are based to some extent on estimates. In 1887 and 1888 an effort was made “to verify the estimates of probable reformation as to 1,722 prisoners who had been paroled prior to September 30, 1887.” Inquiries to prisons, relatives, employers, and acquaintances of the men were made. Definite information was received as to 1,125 of those paroled. Of that number reliable information was received that 78.5 per cent. had not fallen into crime. This would give a percentage of 51.28 known to have been reformed out of a total of 1,722 paroled. After six months of satisfactory conduct on parole a prisoner receives an unconditional release.

The Elmira Reformatory receives males between the ages of sixteen and thirty, after their first conviction of a crime punishable by confinement in a state prison. They cannot be confined longer than the maximum term of imprisonment for the offense of which they have been convicted. The minimum term of confinement is not fixed. On admission a full description is taken, including mental capacity, moral qualities, education, occupation, previous surroundings, parentage, possible hereditary tendencies, etc. The inmate is put first into an intermediate or probationary grade for six months. For bad conduct he may be at any time reduced to the lowest grade. After good conduct for six consecutive months he is advanced to the highest grade. It is possible for an inmate to earn his parole in twelve months. The average time of detention of those paroled, for six years prior to September 30, 1893, was twenty-two months. The average maximum term of all indefinites received during the same period was five years and nine months.

The reformatory combines within itself a prison, a school of letters, a school of technology, a school of physical training, a series of manufacturing departments, and a military organisation. The trade schools embrace thirty-four different trades, and gave instruction, in 1893-'94, to about eighteen hundred inmates. Although carried on primarily for instruction and not for profit, the manufacturing departments realised \$53,458.47 profit for the year 1892-'93.

Under the Elmira system no inmate is paroled until he has a situation provided for him and enough money to his credit to support him until he receives his first month's wages. He is under surveillance for six months, and may be returned to the reformatory at any time within this six months should he violate the conditions of his parole.

The agencies which operate in bringing about these remarkable results are the following:

1. The indeterminate sentence, which gives hope of release and incites to efforts at reformation on the part of the inmate.
2. The strict and inflexible discipline, including military training. Most inmates have never been taught self-control and have never been subjected to discipline.
3. Physical training, with no opportunity for committing excesses of any kind.
4. Removal from surroundings and associations of a demoralising character.
5. Educational and technical training.

Pike, the distinguished author of "History of Crime in England," says: "There is one great preventive for crime, one great antidote to instincts inherited from the past, and that is education."

To summarise, a criminal by instinct, his criminality fostered and developed by surroundings, absolutely illiterate, without a trade or means of earning an honest living, with a feeble and vicious physique, may be discharged from the reformatory on parole, physically well and strong, with an education not beyond his station, a skilled mechanic with good employment under honest surroundings. He has six

months in which to learn self-reliance and is then a free man. The Elmira Reformatory well deserves its position as the model institution of its kind.

It is so rare that a criminal more than thirty years of age—except the criminal by passion and the criminal by occasion—is reformed, that such are excluded from the benefits of purely reformatory institutions. The objects in the treatment of these and of the incorrigible younger criminals are the protection of society and deterrence by example and fear of consequences of crime. Imprisonment and protracted surveillance of habitual criminals is an essential element in the protection of society against the habitual criminal; and an imprisonment which has no attractions of any kind. An imprisonment at hard labour, the prisoner supported by the barest necessities of life, with the most rigid discipline and persistent surveillance after release, is what is required, not as retribution, but for protection alone. A dangerous man, like any dangerous animal, should be prevented from doing harm. We confine a dangerous lunatic, largely for our own protection; but not under conditions intended to deter men from becoming insane or to deter other lunatics from committing violent acts, as is evident. Although an habitual criminal may be one by heredity and instinct, he is still capable of a certain self-control and can appreciate the consequences of criminal acts. When these consequences show little chance for profit and involve seclusion from society, at hard labour—which is always repugnant to the born criminal—and with no comforts or distractions, they cannot fail to exert a deterrent influence; but humanity demands that criminal jurisprudence and administration should carefully separate from the class of incorrigible and habitual criminals the criminals by passion and by occasion.

The idea of restitution and reparation enters very little into the existing methods of treatment of criminals. Crime should be rendered as little profitable as is possible; and in simple justice, the state should force the criminal to make restitution and reparation to the injured to the fullest possi-



ble extent. Nothing will more efficiently deter crime than taking away or largely diminishing the profits of criminal acts. This idea of restitution and reparation pervades the Italian school of criminology and is well represented by Garofalo. Speaking of a certain class of crimes against property, Garofalo, quoted by MacDonald, says:

“For this there is nothing better than the forced payment of the fine and damage to the injured party. This would produce other advantages to society. An unfaithful cashier or fraudulent bankrupt would know that if once discovered he could not enjoy the smallest part of the money stolen, but would have to return all, every penny, or otherwise he would have to work for an indefinite time for him whom he had robbed. This is a forcible way of causing the sudden reappearance of the sum that might be thought to be in the hands of consorts. This is much more useful than imprisonment for a fixed time, which is no profit to any one, and only adds to the damage from the crime the expense of supporting the prisoner. If the money has really been spent the offender must work without respite for the repayment of the injured party. If he will not do it voluntarily, he will be obliged to do it by working for the state, where there is no bread without labour. If, in spite of his efforts, he is unable to gain a sufficient sum, after a certain number of years, according to his age or his good will, this constraint can be fixed to ten or fifteen years; but this term should be lengthened as soon as a want of assiduity is noticed. If the delinquent fulfils all his obligations, he is to be released, and deprived only of his political rights, with interdiction of any public function, or of exercising commerce, if it is a case of a bankrupt.”

It is evident that the subject I have chosen is too large to be adequately considered in a public discourse of reasonable length. The treatment of those guilty of crimes simply against the person, including homicide and murder, of sexual perverts, vagabonds, tramps, beggars, alcoholics *et id genus omne* must be passed over. Alcoholism and prostitu-

tion exist and will exist. What shall be done with alcoholics and prostitutes, are questions of great importance and problems that the medical profession should attempt to solve. These problems cannot be considered here; but I cannot refrain from a brief discussion of capital punishment.

Capital punishment eliminates the criminal, and relieves society from the dangers that might come from his possible posterity. The execution of criminals is a simple and easy method of extermination. Aside from the satisfaction of the idea of retribution, the advantages to society of extermination, and the supposed deterrent effect of executions commended to jurists the severe punishments which were inflicted in the last century. Blackstone, writing about the middle of the eighteenth century, says that no less than one hundred and sixty crimes were made punishable by death in England by acts of Parliament. The cruel and atrocious tortures and punishments in earlier times, mainly the offspring of fanaticism, may well excite our horror. The Inquisition, with nearly three hundred and fifty thousand victims between 1491 and 1808, the burning of persons accused of witchcraft at Salem in 1691 and 1692, are shocking examples of legalised cruelty. At the present day, capital punishment is practically limited to the crime of murder.

It is pretty generally conceded that a man has a moral right to take the life of another in defense of his own; but have we a moral right to take a human life, either in the exercise of retribution, to prevent subsequent harm at the hands of the criminal, or to deter, by example, others from taking life? If it be criminal for an individual to take the life of another from motives of vengeance, it is equally criminal for society to take a human life as punishment for crime. At times of great danger it may be necessary to sacrifice human life to preserve discipline; but this is a measure of self-defense. We certainly should be able to prevent a murderer from repeating his crime without committing a legalised murder. The only argument, to my

mind, that remains in defense of capital punishment is that it may be deterrent.

The arguments advanced by the advocates of capital punishment are certainly very strong. Garofalo says that murders always increase in proportion as the severity of the punishment for this crime is relaxed; and he cites statistics from Belgium, Italy, Great Britain, Switzerland, and France in support of the view that the effect of capital punishment is deterrent. On the other hand, there are strong arguments in support of the proposition that capital punishment is not deterrent. That public executions are demoralising and brutal, every one will admit. The moral insensibility of murderers is well known, as well as the bravado of those who pose as heroes and the emotional displays of those who profess repentance and "change of heart." MacDonald quotes a statement, that out of a hundred and sixty-seven persons condemned to death in England, a hundred and sixty-four had been present at executions.

The argument that I shall present against capital punishment, and one that I think cannot be successfully controverted, is that the taking of human life as a punishment for crime is in itself a crime, is a relic of barbarism and unworthy of our present civilisation. No physician can consistently countenance the taking of human life. When we cannot and will not mercifully do this to put an end to suffering in cases of incurable disease or in the case of dangerous and hopeless lunatics, much less can we approve of it as a punishment or to deter possible criminality in others. We may destroy the life of an unborn child to save the life of the mother; but then it is with extreme reluctance and repugnance for the act. Compared with acts of savage brutality, such as cannibalism, we may quote, with MacDonald, the words of Montaigne, who says, "It is more barbarous to kill a live man than to roast and eat a dead one." We need not go very far back to find acts provided for and sanctioned by law and so-called necessity which civilisation would not tolerate at the present day. Before Pinel, in 1792, with his

own hands removed the chains from lunatics at the Bicêtre, the conditions of confinement of the insane were horrible beyond description. The tortures of criminals and suspects a few decades ago were worthy only of savages; and many of the executions were brutal murders. When John Howard made his inspections of penal institutions in 1773, the prisons were hells upon earth. As scientific progress has brought about the wonderful reforms in the treatment of the insane, so the same spirit should remove the last glaring relic of barbarism, capital punishment. It is an unworthy reproach to science to assert that society has but one way of deterring the greatest of all crimes, and that is by repeating the crime itself under the cover of law. Even in the punishments which are necessary to the enforcement of discipline, the "golden rule" laid down by Pike should be observed: "Let them not afford an evil example of cruelty to the spectators."

Emancipation from fanaticism and bigotry is the first necessity in the intelligent treatment of crime. Fanaticism is responsible for the early persecution of scientific discoverers, such as Galileo, the persecution of the Jews, the massacre of St. Bartholomew, and the numberless crimes committed in the name of the divine right of kings. The Puritans landed in America in 1620 to escape religious persecution and to enjoy religious liberty; and they hanged witches in 1692. No great progress can be made in the reform of criminal jurisprudence until the laws based on bigotry and intolerance of personal and religious liberty are removed from the statute books.

It is to the physician and the scientific student of crime that we must look for real reforms. The history of criminality is full of solemn warnings of dangers incident to existing systems in the treatment of crime, and the greatest of these is heredity. The history of "The Jukes" conveys this warning in the strongest possible manner. We are justified by public opinion in protecting ourselves from the dangerous insane by perpetual confinement. The dangers

we have to provide against from the habitual criminal are much greater, as he is an enemy with more or less intelligence, acting with method and in concert with others. All criminologists agree that such criminals, when irreclaimable, should be put under perpetual confinement or surveillance.

Dugdale says: "In dealing with the habitual typical criminals who are contrivers of crime, criminal capitalists and panders, where we cannot accomplish individual cure we must organise extinction of their race. They must sternly be cut off from perpetuating a noisome progeny either by the propagation or perversion of a coming generation. The old laws attempted this extinction by hanging; but for us it must be perpetual imprisonment, with certain mitigations to guard against barbarity. For this class, congregate imprisonment is perhaps the most suitable."

Dugdale evidently did not care to suggest a method of organising "extinction of their race;" but one less severe than hanging readily suggests itself. It would not be difficult to devise a method of sterilisation of irreclaimable born criminals which would not offend sentimental public opinion; this to be applied, not as a punishment for any particular class or classes of crime, but merely for the protection of society, and after a full scientific investigation of every case.

In concluding my very inadequate treatment of the great questions considered in this discourse, I do not make any formulated suggestions; but it must be evident that criminology and penology should receive more attention at the hands of the medical profession. The state of New York is the birthplace of practical penal reform. Let her do her full share now in the good work! While it would be desirable to adjust our criminal laws so as to bring them in accord with the present scientific status of criminology, existing laws admit of important reforms. A scientific spirit might be infused into the prison commission if it included members of the medical profession. Physicians to prisons should study criminals according to modern



methods and not simply prescribe for their bodily ailments. Much study and accumulation of material is necessary to bring criminal anthropology to a condition approaching a positive basis, and for this work criminologists look to the medical profession. As I have already said, I venture to hope that criminology and penology will not be neglected by the New York State Medical Association.

## THE CRIMINAL, HIS SOCIAL AND LEGAL STATUS AND THE PHILOSOPHY OF REFORMATION.

By WILLIAM A. WHITE, M. D., of Broome County.

*October 17, 1895.*

Degeneration, among the specialists in psychological medicine, is the topic of the day. The various periodicals devoted to this and allied specialties are replete with discussions of its many results, and all departments of human thought are beginning to feel the subtle influence of the new hypothesis. Introduced to the scientific world by Morel<sup>1</sup> in 1857, its importance was for a long time unrecognised, until within the past few years its championship by the Italian school has brought it more forcibly to notice. During the years subsequent to 1857 much important scientific work was done, and many notable publications appeared, especially Darwin's "Origin of Species" and Spencer's "First Principles," thus furnishing invaluable data for the elucidation and further investigation of the problem of degeneracy, so that when Cesare Lombroso published in 1876 his "L'Uomo Delinquente," the world was not so slow in appreciating the true importance of the questions dealt with. In fact, at present, the unprofessional public are manifesting a surprising interest in the subject matter included under this denomination, and read with eagerness the many works which have recently appeared, dealing with its various branches. This universal interest displayed is perhaps the best possible thing which could happen, as degeneration is a danger which threatens the very safety of the social struct-

<sup>1</sup>Traité des Dégénérescences Physiques, Intellectuelles, et Morales de l'Espèce Humaine, et des Causes qui Produisent ces Variétés Maladives. Par le Dr. B. A. Morel, Paris, 1857.

ure, and threatens it in a form which advancing civilisation appears to favour rather than discourage. To estimate the importance of the problems connected with degeneracy we have only to stop and consider that all of our defective, dependent, and delinquent classes—that army of parasites which infest society—are largely constituted of degenerates; and great though it may be, statistics show, so far as they can be interpreted, that it is adding to its numbers year by year. Society is thus threatened by a sort of internal revolution, which, if not averted, augurs ill for the future. But let us hope that the efforts of our scientific benefactors have availed to bring the enemy out of his hiding-place into the light of the sun, where his operations can be observed, and where proper methods of attack may be organised and directed against him.

Society is an organism compounded of individuals, classes, and institutions, much after the manner in which the animal organism is composed of cells, tissues, and organs, and, like all organisms, is subject to be affected with disease and disordered functions. Such a disease is degeneracy, of which crime is a symptom, and the causes which produce it produce alike the criminal—a degenerate, out of harmony with his social environment and directly anti-social in his instincts.

The causes, degenerate in nature, which operate to produce crime, are manifold. Social evolution has proceeded during the last century with a rapidity never before known. With the rise of republics the people as a whole have been forced more and more into direct relations with the governing classes; problems of great magnitude have had to be met, dealt with, and solved; and the social organism has been subject to a stress of circumstances which it was ill-adapted to sustain. The natural result has been the production of an unstable condition—such, for instance, as is well illustrated by our present financial uncertainty coupled with the serious division between capital and labour. This condition produces its most deleterious effects upon the poorer

and humbler class—those least able to bear with adversity—and reacting upon the units thereof, produces degenerate and deformed individuals. No remedy for this condition of affairs presenting itself, the individuals upon whom the results of the social stress fall most heavily, reproduce their kind, and the vicious circle is established.

Every organism, individual or social, is composed not only of the matter which goes to make its form and consistence, but of force, without considerable proportions of which life would cease to be. Now it can be readily seen that a community whose forces are dissipated in an unduly hard struggle for existence, whose energies and whose bodies are consumed with the toil for the necessary means of subsistence, are ill-constituted to bring forth and support children. These children, ushered into the world under such unfavourable circumstances, lacking in a proper supply of the developmental forces, surrounded on all hands by misery, poverty, and the degraded and degenerate residue of former generations, become our future criminals. Is it strange? Would it not rather be remarkable if such children, with every possible inducement to wrong doing, uneducated, neglected, ignored by every higher influence, should develop into worthy citizens? Impossible! Cause and effect are as rigid in their sequence here as elsewhere, and under such circumstances, where the causes are so powerful, so overwhelming, the effects are inevitable.

There are many classes of criminals. A man aroused to passion by an insult reaches for the nearest available object and strikes his fellow. If that object be harmless, well and good; if not, he becomes a criminal. He is the "criminal by passion." With him we are not especially interested: he constitutes rather an accident than an anomaly. Substantially the same might be said of the "criminal by circumstance." Compelled to work, mayhap, for the miserably inadequate wages which the investigations of the Reinhardt committee in New York have shown are being paid, he is forced, out of sheer adversity, to thieving; or if a woman, to

that equivalent of crime in the male—to prostitution. With the “occasional criminal,” the “habitual” or “professional criminal,” and the “instinctive criminal,” however, we have the closest interest. They constitute the criminal hierarchy, the origin of which I have been describing: these are the degenerate anti-social elements; these are the offenders who are constantly overriding legal prohibitions and warring upon social customs, and with these especially we must learn to deal.

The great importance of the criminal classes being now manifest, and the pressing nature of the questions connected with them being evident, it becomes of prime importance to formulate those signs and symptoms by which they may be recognised and differentiated from normal persons.

Inasmuch as force manifests itself through a material medium, it becomes evident—reasoning from first principles—that any great alteration in either the quantity or quality of the component forces of an organic unit will become evident through variations in its material elements. Further, we should expect to observe that these variations were greater in the most highly elaborated structures and became less marked as we descended the scale to structures of greater simplicity and stability. Accordingly it is in the brain that we should expect to find the clearest evidences of degeneracy; and while we do find such symptoms as moral obnubilation, emotional instability, vanity, egoism, and in general a low order of intelligence, yet, largely owing to our lack of definite knowledge, little is actually known respecting anomalies of cerebral structure, these symptoms bespeaking rather a disorder beyond the power of human eye to observe. It is rather in the skeleton, the component elements of which are pretty well known in all their details and which form a permanent register of the alterations in them, that we find the variations from the normal readily appreciable and easily recognisable. Thus we have anomalies in cranial and orbital capacity, anomalies in the various indices, angles, diameters, and circumferences



of the skull, the conditions known as oxycephaly, plagiocephaly, scaphocephaly, platycephaly, prognathism, strabismus, diastema of teeth, narrow palate, and many other variations from the normal.

These signs of degeneration, a few only of which I have enumerated above, constitute the individual possessing them a degenerate; his type of organisation is lower, more primitive, less highly organised than it should be, and, placed under unfavourable conditions, he is predisposed to commit crime.

The question of a criminal type has been much discussed. The degenerate class is a large one, and includes in its ranks geniuses, insane, criminals, paupers, suicides, idiots, imbeciles, and many other forms of deteriorated humanity, and the signs and symptoms which characterise this condition are fairly well known and pretty generally recognised. But whether it is possible by means of this knowledge to forecast the relative possibilities of a given person becoming a criminal, insane, or perhaps a genius; or, on the other hand, to distinguish the type as it exists in the prisoner at the bar, and utilise such knowledge as an aid in the administration of penal law, these are the vital issues. Many of our enthusiastic Italian collaborators believe they can, and Lombroso has even gone so far in one of his latest works on "Chi-rography" as to claim ability to distinguish not only the criminal by means of his handwriting, but detail the character of his crime. Be this as it may, the question of a criminal type is still a mooted one, and much might be said with good effect upon either side. It is certainly reasonable to suppose that a somewhat more exact classification of the degenerate class, on the basis of physical signs, might be arrived at, thus separating what is now a very large and heterogeneous admixture into subdivisions of approximate scientific accuracy. Certain it is that as investigation proceeds further and further we approach this result, and it is probable that although the present may not recognise a well-defined criminal type, yet that the near future may see its aspirations to this goal realised.

The true criminal is then a degenerate, possessing certain characteristics, both bodily and mental, which serve to distinguish him from the normal man, and which indicate that his organisation is such as to predispose and even impel him to crime. This being the case, what should our attitude be toward him? What are the duties of society with reference to these anti-social elements? Before we can consider these questions, however, that most important and much-discussed problem of responsibility must be dealt with, for largely upon its solution will our future course of action be guided.

First of all, then, let me urge one consideration which applies here as it does to the insane,—in fact, to all of the degenerate classes, yes, even to the normal individual, and which for some unknown reason never appears to have firmly impressed itself upon the judicial mind—and that is, that the question of responsibility is a question of degree. Three factors are involved in its consideration: *First*, knowledge of the nature and quality of the act performed; *second*, the forces which impel to action; and *third*, the forces which tend to inhibit action. A proper relation, a proper balance among these factors, is necessary to constitute an individual as a responsible party, and disorder seriously affecting any one of them is sufficient to constitute him as irresponsible. They are what mathematicians would probably call three “independent variables,” and they may bear one to the other, in respect to quality and quantity, any possible series of relations. That the existence of these factors in proper relations is necessary to constitute responsibility is a scientific fact, and not a pure psychological speculation, is proved by numerous instances of their disorder.

Little Marie Schneider,<sup>1</sup> whose case is cited by Dr. Paul Lindau,<sup>2</sup> a twelve-year-old school girl, robbed and murdered her companion, Margareta Dietrich, aged three and one half years. When questioned regarding her crime, she told a

<sup>1</sup> A full description of this case can be found in *The Criminal*, by Havelock Ellis, London, 1890.

<sup>2</sup> Dr. P. Lindau, in his Appendix to the German translations of Lombroso, “*Der Verbrecher*.”

plain, simple, straightforward story in an entirely unassuming, childish manner, and without evincing the slightest remorse for her act. She was entirely ignorant of the distinction between right and wrong. The wretched sufferer from an impulsive homicidal obsession may kill his dearest friend and yet be for the time being so entirely controlled by the automatic action of those forces which impel him onward that resistance is impossible. The young woman who, yielding to the persuasions of an ardent lover, murders the product of her illicit intercourse, must indeed be lacking in those higher elements of mind, largely inhibitory in function, whose duty must always be to control the lower impulses of our nature.

These three factors of responsibility, to which and to the disorders of which I have directed your attention, are abnormal in the criminal; and their abnormality is in direct proportion to the approach of the criminal to the "instinctive" type. Yet criminal law takes no cognisance of these conditions unless combined with insanity, and even then only recognises the first, at least in this state, which may to all intents and purposes be taken as a fair representative.

Witness the following quotations from the Penal Code of New York state: "A person is not excused from criminal liability as an idiot, imbecile, lunatic, or insane person, except upon proof that, at the time of committing the alleged criminal act, he was labouring under such a defect of reason, as either 1. Not to know the nature and quality of the act he was doing, or 2. Not to know that the act was wrong" (Section 21). And further, "A morbid propensity to commit prohibited acts, existing in the mind of a person who is not shown to have been incapable of knowing the wrongfulness of such acts, forms no defense to a prosecution therefor" (Section 23).

Here we have concisely expressed the actual status of mental disorder as a defense in cases of criminal procedure, and with it the proof of how far in the rear of the frontier of medical science our legal brothers are. In the first instance, it seems to me, our law-makers never should have

presumed to codify those mental states which may be admitted as defense in criminal cases. The question of responsibility is entirely and purely a medical one, and only the trained expert who has spent years in the observation and study of mental states, both normal and diseased, is capable of passing upon it. Laws are very well in their place, but I think those which I have quoted overstep their natural prerogatives, and that for the purposes of justice, in the abstract at least, it were better had they never been written.

Further than this, the methods of eliciting and interpreting expert testimony are everywhere at fault. Too little public interest is shown in the organisation of juries, and many of the men best fitted for such duties, if not already legally exempt therefrom, are the most willing to escape them, and other means lacking, there are but few, in this newspaper-reading community, who, without serious shock to their conscience, cannot gain exemption on the ground of "actual bias."<sup>1</sup> But with all the faults of the jury remedied it still seems highly illogical that any body of laymen should be called upon to listen to, and decide the comparative merits of, various expert opinions of medical men. Certain it is that they can, in a technical case, understand but a small portion of such evidence, and are further especially poorly qualified, from their very lack of education on such subjects, to appreciate its several bearings. Add to this that the testimony elicited from the medical expert does not always, by virtue of the present methods, express his very best opinions, and we have a procedure bristling in faults, and of such a nature that we should not be surprised at the frequent miscarriages of justice. The principle of "presumed innocence"<sup>2</sup> is a proper one, but it should be the duty of a judicial body in a given case to use every endeavour to get at the actual facts; but with the present methods of utilising the expert such is not done. Either counsel is at liberty to ask such questions as he may see

<sup>1</sup> N. Y. State Code of Criminal Procedure, 1893, Sec. 376, Sub. 2.

<sup>2</sup> N. Y. State Code of Criminal Procedure, 1893, Sec. 389.

fit, provided always that no legal objections be entered against them, and he utilises this privilege to endeavour to the best of his ability to bring out all points favourable to his side, and suppress all those unfavourable, and further, recognising the importance of the effect produced upon the jury, he is frequently able to so adjust his questions as to compel the witness to give answers which produce an impression entirely contrary to the opinion he really holds.

Do not think that I am endeavouring to tear down the judicial fortifications. I am rather only endeavouring to point out some of their weak spots, to locate their pregnable points, so that they may be strengthened and repaired and offer a security to society sufficient to guarantee its quiet repose within their protection.

That the question of the treatment of the criminal has until the present time been ineffectually answered is everywhere manifest. Every civilised community affords indisputable evidence of the inability of the judicial body to deal with him. In almost all countries crime is increasing. Such being the case, the crying need for a solution to this problem is painfully manifest.

We must not forget, however, that the causes of crime lie largely in the environment. Lacassagne has said "Every society has the criminals that it deserves." That there is something radically wrong in the organisation of the state, we have had occasion only too strongly to suspect in the unhappy results of our recent strikes; results which M. Tarde would undoubtedly denominate as "crimes of crowds."

These are errors for which the judicial body is not responsible, and which it cannot remedy. It may only deal with the results of these unfortunate conditions. But to deal most effectually with them it should be as free from error in its organisation as possible.

To this effect I think more attention should be given in our schools of law to the scientific departments—to sociology in particular. Experts should not be pitted against one another, and thus indirectly made parties to the issue, but



should be retained by the state, not the individual. They should be men of recognised ability and their evidence not detailed to a lay jury, but after a careful and elaborate examination into the case in all its minutiae, made out in the form of a report to be presented to the court, and their decision regarding the prisoner's mental condition should be final and afford a criterion by which to regulate the nature and extent of the sentence imposed. The public should be aroused to a deeper sense of their responsibilities as citizens, and no longer shirk the duty which the community asks of them when it empanels them as jurors.

After all this is done the question still remains, as to the best method of dealing with the convicted criminal. This is the question in which we are especially interested, and the one which, from a criminological point of view, it is our special function to discuss.

In the first instance we must never lose sight of the fact, that, as a rule, we are dealing with a degenerate, abnormal, illy-balanced, poorly constituted, individual, and that though he may not be wholly irresponsible, yet he is certainly much less responsible than a normal man. We are dealing with a man who has performed an anti-social act—an act, the ultimate causes of which lie far back of the immediate perpetrator, in the very organisation of society itself. Bearing these facts in mind, we will see that there is but one method to be employed in approaching this question of the treatment of the criminal—the method of science. We must approach the subject in a purely impassioned spirit, convinced that we have a social evil to deal with, and desirous only of advocating those reforms which will best meet the requirements. Anger and the spirit of retaliation should have no place in our system: they are alike valueless for reform and harmful in their results. In fact, directed against the “instinctive criminal,” punishment in all its varieties is of little utility. Lacenaire,<sup>1</sup> a typical French criminal, said to the judge,—“I have always been lazy; to

<sup>1</sup> Abnormal Man, by A. McDonald, quoted in review of *Les Habités des Prisons de Paris*, by Dr. Emile Laurent.

work is an effort. I am incapable of it. If it is necessary to work, I do not care to live. I prefer to be condemned to death." Punitive measures, however, have their place, and undoubtedly operate as deterrents from crime, and subsequently as a means to reformation, but such effects are produced upon the individual only in direct proportion to the distance which he is removed from the "instinctive criminal" and approaches the normal type.

One of the most difficult problems of treatment concerns itself with the method of dealing with the recidivist. What shall we do with the habitual offender, who has been committed to prison time upon time, who resists all applications of punishment and all methods of reform, who spends, in fact, nine tenths of his time in prison and the other tenth getting there? Many advanced thinkers—in fact, no less a person than the eminent Italian criminologist, Baron Garofalo—believe that such individuals, who have proved themselves entirely incorrigible and a constant source of danger to the community, should be quietly deprived of life.

Now while I fully appreciate the nature and strength of the arguments educed in favour of capital punishment, I wish to assert myself as most emphatically opposed to its use for any reason or under any circumstances. I believe that its employment in any case is no less than brutal and barbarous.

If crime is a social disease, and I believe it is, our treatment of it should be in accordance with those same general principles which we adhere to in our dealings with the human organism. In other words, before we can expect to accomplish much good, we must remove the cause. In the face of this, I ask you wherein lies the justice of society which calmly allows and even supports the causes of crime in its midst, and then in cold blood takes the lives of the criminals which its errors have produced? Certainly this method has no inherent rationality to support it, and as for results, I believe it to be entirely futile. It is assuredly not

reformatory, and I think not deterrent. A certain learned criminologist found as a result of his investigations that every criminal condemned to death whom he had visited had been present at several executions.

Further than this, the evil influences of this form of punishment are manifest throughout the community. Witness the morbid interest which the public takes in every murder trial and the details of every execution, an interest enhanced and goaded on by the villainously sensational accounts which appear in our daily papers.

The criminal has always been, and is now by a certain weak-minded element, erected into a sort of hero, and there are a thousand cranks on the face of the earth to-day who have only to have called to their notice the detailed sufferings of some homicide to have their morbid tendencies, which lie dormant within them, stirred into terrible activity, and in their attempts at emulation society dearly suffers. In this sense, as Dr. Aubry<sup>1</sup> has explained, murder becomes contagious, and I think we can all recall one or more epidemics. These results are widespread in their effects, and, taken in connection with the fallibility of human judgment, many painful instances of which might be cited, far outbalance any immediate good which might supposedly accrue from the execution of some poor, miserable, weak-minded wretch.

Let us not jeopardise the best interests of society by inflicting upon the community these disgusting and barbarous practises; let us not, by legally sanctioning such acts, also sanction the egoistic and animal-like emotions which accompany them. Our advance to a higher grade of morality can only occur by the production of such conditions as to admit of the unhampered development of the higher ethical emotions, which are largely altruistic in nature, and we can ill afford to hinder this progress in such a manner, especially when no excuse exists in the nature of an immediate good.

<sup>1</sup> *La Contagion du meurtre, étude anthropologique criminelle.* Le Dr. Paul Aubry, Paris, 1888.

We now come in due course to the consideration of the prison problem. For hundreds of years the recognised method of dealing with the convicted criminal, when he was not actually executed, has been to incarcerate him, for some arbitrarily chosen period of time, within prison walls. During his imprisonment he was sometimes employed, but more often left in idleness, and the treatment he received at the hands of jailers and petty prison officials, whose power in times gone by has been well-nigh supreme, was frequently positively cruel. Nowadays things are changed. Our prisons are marvels of cleanliness, good order, and discipline, and our prisoners are uniformly employed, usually at some useful and productive occupation. Still we are not satisfied, and I think the most superficial observer realises that the prison is not equal to the occasion, and the facts of the increase of both crime and recidivity would tend to support this view. That we may appreciate to advantage the terrible incompetency of our present methods of dealing with the criminal classes, let us look at our statistics,—

Year. <sup>1</sup>	Total prison- ers in U. S.	Ratio to population.
1850.....	6,737	1 in 3,442
1860.....	19,086	1 in 1,647
1870.....	32,901	1 in 1,171
1880.....	58,609	1 in 855
1890.....	82,329	1 in 757

These figures show only too clearly how miserably our prisons fail as either deterrent or reformatory institutions. In fact, the prison does worse than fail, it creates that which it was intended it should check, it is in reality a hot-bed for the production of crime, and is constantly turning out into the community men who are depraved, debased, and skilled in all the vices of criminal art in place of men received who were comparatively harmless citizens, as Emil Gautier writes:<sup>2</sup> "The prison, indeed, as it is organised, is a sewer

<sup>1</sup> Taken from the U. S. Census reports by W. D. Morrison, and quoted by him in his introduction to *The Female Offender*,—Lombroso and Ferrero, New York, 1895.

<sup>2</sup> *The Criminal*, Havelock Ellis.

throwing out into society a continuous flood of purulence, the germs of physiological and moral contagion. It poisons, brutalises, depraves, and corrupts. It is a manufactory at once of the phthisical, the insane, and the criminal." Why is this? It is largely because our criminal is essentially and naturally lazy and fond of debauch. The struggle for existence necessitates a certain amount of hard work of which he is incapable, and he takes to crime as the easiest means of obtaining at once the necessities and the luxuries of life. Discovered and convicted, he finds that prison, after all, is not the worst of places. Heretofore wholesome food, a comfortable bed, and a warm room were almost unknown luxuries; now he finds them all assured, and being very moderate in his requirements for happiness, what wonder that he feels content, especially as these comforts are maintained by a very moderate expenditure of energy on his part?

In fact, the prisoner sinks into the lethargy of a purely animal existence: he becomes a moving automaton, the ordinary necessities of life are furnished him, and by and by the prison itself becomes a necessity.

"A German criminal,<sup>1</sup> who had just been released from prison, attempted rape. He received a sentence of eight years imprisonment. He rose, thanked the court for the sentence, regretting, however, that it was not for a longer period, and adding that he had only committed the offense as an agreeable way of returning to prison, where alone he found pleasant society and a life free from care."

Unfortunately, this is not the worst of the results of confinement in prison. Dr. Aubry's<sup>2</sup> remark is only too true,—  
 "As to the reformation of the criminal, that is a myth; the prison is still the best school of crime which we possess." The prisoners are hustled in together with no semblance of a rational classification. The youth who, while not essentially corrupt and degraded, may have committed his first offence, and needs only a little encouragement to reclaim

<sup>1</sup> *The Criminal*, Havelock Ellis.

<sup>2</sup> *Ibid.*



him from the path whereon he has started, is, on his entrance to prison, thrown into immediate contact with the lowest, most desperate class of society, and, continually surrounded by their evil influences, soon learns to look upon crime with an indifferent eye; and when his sentence expires, we find him leaving prison a confirmed enemy of society.

These are the evils for which present methods must answer. How are they to be overcome and wholesome results ensured? To this question it is the business of the criminologist to reply.

In regard to this question of treatment, the prime factor in the make-up of the criminal, the factor upon a consideration of which are founded the principles of rational treatment, is the factor of the criminal's lack of adaptation to his environment.

The criminal, like other degenerates, is essentially an individual out of harmony with his environment, and, in order that he may become a useful citizen, we must create within him that adaptation which is lacking. To this end are our reformatories organised. Here an environment is created lacking in all those elements which tend toward evil and containing only those which tend toward good. Within this environment the criminal is placed.

Now there are two defective conditions in the mental organisation of the criminal which must be dealt with in this artificially produced environment. *First*, the adaptability of the organism to surrounding circumstances presupposes on the part of the nervous substratum of mind a certain permeability permitting of the formation of channels of association answering to novel experiences. This permeability is lessened in the criminal. *Second*, many of the associations which have been formed by him answer to disadvantageous environmental relations, and inasmuch as by repetition these tend to become organised into fixed habits, he presents a number of such on admission.

In order that these two defects—namely, defect in permeability and in quality of association of the nervous elements—

may be remedied, cerebral nutrition must be advanced to the highest degree of efficacy, indirectly through the effect of a general increase in bodily health. This having been accomplished by means of well-known principles of hygiene, gymnastics, dietetics, etc., we have a basis upon which to build.

That the defect in permeability may be remedied, the defective is placed at first under conditions of comparative simplicity, and of such nature that he is able to adjust himself to them; being lazy, he must have habits of industry inculcated within him, and so is allowed to choose a trade, into the simpler departments of which he is ushered. As he advances his surroundings become more and more complex, further requirements are made upon his powers of adjustment, new fields of work and thought are gradually opened up to him, and he is thus slowly but surely harmonised with surroundings more complex. That the faulty habits acquired before admission may be destroyed, there are no incentives to the continuance of the associations on which they were founded admitted to him, and the trend of his education must be such as not only to exclude them but to build in their places virtues and an enlightened intelligence which recognises their fallaciousness.

That these results, which I have sketched in only a very general way, may be brought about, a considerable deal of time is required,—an amount directly proportionate to the difficulty connected with the individual case—and, that time may not be wanting, the criminal's reform should not be hampered by any arbitrarily determinate sentence. In other words, the criminal should be sent to the reformatory to stay until cured, and he should not be allowed to reënter the community until he can do so with safety.

The offender, upon admission, is firmly impressed with the fact that his ultimate discharge rests wholly with himself; that for every success he will reap the proper reward and advance, and for every failure a corresponding punish-

ment; and that he will not be allowed his liberty until he has attained to a certain standard. During his residence he is carefully observed and studied by competent men selected for that purpose. When it is concluded that he is probably cured, he is paroled, and if he does not abuse the privilege, at the end of a reasonable time he is discharged as soon as a self-supporting situation can be obtained for him.

These, then, are the requirements which in the main must be fulfilled by any system of treatment which aims at the reformation of the criminal. The artificially created environment of the reformatory must resemble as closely as possible the outside world. The process of adaptation to it must resemble in detail the struggle for existence, rewards and punishments following in the natural course of events, and adjusted to the relations of the case in such wise as to follow inevitably upon conduct which is good or bad.

Cure under this method of treatment is only accomplished when the individual shall have reached such a stage of development, and shown such ability to adapt himself to the most varied and novel circumstances, that it may with reason be expected that he will be able to fulfil the requirements of a self-supporting and reputable citizen.

Such methods as these, where they have been carried out, commend themselves to us by their success, both in lessening recidivity and in creating good and useful citizens. Probably Elmira, of all places in the world, exhibits this scheme of reformation in its most advanced stage of development, and a reference to their "Nineteenth Year Book" shows that since the opening of the institution in July of 1876 they have received a total of 7,047 prisoners; of this number 5,933 have been discharged. Of the number discharged 3,628 are estimated as probably reformed, or 51.48 per cent. of the total admissions, or 61.16 per cent. of the total discharges, there remaining September 30, 1894, 1,143 under treatment. Certainly, if these figures are even approximately correct, we must admit that Elmira, as an experiment in penology, is a success.

In 1880 the total cost to New York city alone of the mere maintenance of its police department was \$3,266,057.<sup>1</sup> It is tempting to speculate to what advantageous purposes such an amount of money might annually be appropriated. Such speculations must, however, remain unrealised so long as the criminal class is as numerous as it is to-day, and it will ever remain as numerous until the criminal is recognised for what he is, a degenerate, produced by natural causes, and until his treatment is based upon rational and scientific principles. The spirit of retaliation by punishment is no longer admissible; the perpetrator of crime is more often to be viewed as the unfortunate result of circumstances over which he had no control; but the forces which produced him must be deviated into other channels ere society can rest safely from his encroachments.

<sup>1</sup> Report on the Defective, Dependent, and Delinquent Classes of the Population of the United States, as returned at the tenth census (June 1, 1880), by T. H. Wines, special agent.

## ADDRESS: THE PRESENT STATUS OF OBSTETRICS.

By HENRY McM. PAINTER, M. D., of New York County.

*October 15, 1895.*

I have the honour to address you to-day upon the subject of obstetrics, and to call your attention to the present status of this department of medicine.

In looking over the history of medicine, we find that the science and art of obstetrics has experienced the same successes and reverses of fortune as the other branches of medicine; at times standing upon a scientific basis, furthered by the devotion of scientific men, and again fallen into the hands of priests and mystics. So with obstetrics: now the life-work of brilliant minds; now the neglected crumb falling to the waiting hands of ignorant midwives.

To-day a very significant set of circumstances confronts us, but the significance of the situation seems to have been appreciated by only a few. Within forty years has sprung up a specialty in medicine known as gynaecology—the science of the diseases of women; a specialty which has brought, perhaps, more relief to suffering humanity than any other special branch of medicine. It has developed with the most astonishing rapidity, and has commanded the devotion of many of the most brilliant minds of our generation. It has called away from pure obstetrics, to its own shrine, two of the most gifted scholars and most careful clinical observers in the profession to-day.

But what is the fact with regard to gynaecology? Simply this: that a large proportion—I will not attempt to say *how* large, but a large proportion—of the cases coming under the care of the modern gynaecologists have their pathological origin in errors or accidents occurring during the pregnant,



parturient, or puerperal state. I have said "errors" or "accidents," and it matters little which it be. Both are common enough, and both would be made less common by a more thorough study of the science and art of obstetrics.

We have confronting us, then, an incongruous condition in a specialty of medical study and practise—gynaecology—taking birth and growing beyond compare, because medical men are, to a greater or less extent, ignorant and unskilled in one of the seven fundamental subjects of medicine. And this ignorance and lack of skill can be traced to but one cause—inadequate instruction. In this regard the subject of obstetrics has shared the common fate of all medical study, but it seems also to have suffered rather more neglect than its sister subjects; perhaps because parturition and the parturient state are looked upon as physiological processes, and it has therefore been deemed sufficient that the medical student should acquire a moderate theoretical knowledge of the physiology of the subject. In this regard two things are to be noted,—

1. That young men, with whom it is possible, feel to-day that they must spend three or four years after their graduation in acquiring the knowledge necessary to fit them conscientiously to practise medicine upon their fellow-men. But what of those who cannot afford to obtain the necessary preparation, and they are by far the great majority?

2. It is a very significant fact that the students of one college alone in this city have, for at least ten years, spent \$30,000 annually in obtaining the services of young men outside the college to instruct them in medicine. Medical students are not proverbially rich; in fact, they are proverbially poor. Their time is sufficiently occupied by their college duties, and yet they insist upon making time in their busy lives to recite daily to their quiz-masters.

Why, then, do they do this? Few seem to have asked the question. Would they do it if they felt that they were obtaining the instruction which they needed at college? Assuredly not! The fact is, that the present system of

medical instruction is obsolete, and utterly inadequate to prepare them for the practise of their profession.

In no branch of medicine is it more noticeable than in obstetrics. In no other branch of medicine does the glaring incongruity occur, of a full-grown, thriving specialty finding a large proportion of the work which occupies its time and attention, in human bodies, made invalid through ignorance of the fundamental principles of medical art. I speak thus only after thought and experience. What are among the most common causes of uterine displacements, of endometritis, of chronic metritis, of tubal disease, of pelvic peritonitis? Rupture of the perinaeum, improper care of the puerperal state, infection during labour or the puerperium, improper management of abortion, and ignorance of the management of the third stage of labour. Does any reasonable man think that these things can be taught in the lecture room? Does any physician before me to-day believe that he was so very much better qualified to practise obstetrics when he graduated in medicine than an experienced midwife? Does the fact that all of his first cases did not die of haemorrhage or sepsis, or at the best, end in the gynaecologist's office, prove anything more than the eternal goodness of the Almighty? Later in life we are wont to speak jokingly of that timidity which was born of an honest appreciation of the inefficiency which characterised the early days of our medical practise. Verily it is a grim joke at the best. Is it not rather in truth, a terrible arraignment of our medical schools? When the speaker began the study of medicine, he was told by a physician, who might be considered a typical representative of the great average of the medical profession, that in the majority of obstetrical cases, there was nothing to do, except to be sympathetic, and to tie the cord after the birth of the child.

The speaker subsequently had the good fortune to obtain a very different view of the subject from the lectures of the professor under whose teaching he sat. But such a state-

ment represents the opinion, and what is worse, the practise, of a large number of medical men to-day.

They do not realise that in every normal case of labour are the probabilities of at least several years of invalidism. If they realise the probabilities, they have never been instructed to a point of efficiency in so controlling the physiological progress of labour as to make perfect the work of nature. They have heard in lectures of the management of the first stage of labour, in order to aid and expedite the dilatation of the cervix. They have heard in lectures of the different methods for the "support" of the perinaeum; a more vicious and misleading term is scarcely known in all medicine. They have heard methods for the expression of the placenta described in lectures. They have heard the manifestations of postpartum haemorrhage graphically pictured. Will they thus be able to cope with these conditions when they arise? If they be men of unusual ability, they will possibly work out these things among their own patients; that is, they will learn that which they paid their instructors to teach them, at the expense of their patients who come to them, for the skill which they do not possess.

It may be contended that this is an exaggerated statement. It may be contended that the importance of special skill in the lying-in-room is over-estimated. The irresistible answer to both objections is, "Ask the gynaecologists what they are doing to-day."

Again, it may be contended that men who have studied carefully their lectures as students, are able to do these things intelligently and skilfully. In reply it may be said that it has been the speaker's fortune during the past five years to give both theoretical and practical instruction in obstetrics to both medical students and practitioners of medicine. Let us take a single point. In no instance can he recall any adequate, efficient knowledge of the management of the perinaeum—that subject so much lectured upon. Nay more! Rarely has he found a man, either student or practitioner, who was capable of recognising certain very

common forms of perinaeal laceration ; some of which lead with absolute certainty to relaxation of the vaginal walls and displacement of the contents of the pelvis. Nor do they understand any more practically many other phases of obstetric work. That there has been an enormous improvement, nevertheless, in the character of obstetric work throughout this country cannot be denied, but it is due largely to two agents, asepsis and the obstetric forceps, and not in any degree to improvement in methods of teaching.

To asepsis is due the complete extinction of the frightful epidemics of "puerperal fever," which have swept through our hospitals within the memory of the present generation.

To the forceps is due, among other things, the almost complete obliteration of a condition known familiarly to every gynaecologist of fifty years of age to-day, the vesico-vaginal fistula.

If the details and the manifestations of sepsis were now thoroughly and practically taught in our schools ; if the use of the forceps were carefully inculcated by actual application, many other conditions of pelvic disease seen only in isolated cases, but seen very commonly, would also be seen no more.

What then is the state of obstetric teaching in this country to-day ? Taking the methods used in the principal medical centres of the East—Baltimore, Philadelphia, New York, and Boston, we find in each some of the essentials to a complete system.

In New York, the College of Physicians and Surgeons now gives in addition to its course of lectures, a series of class-room recitations by an instructor ; a manikin course by the staff of the Sloan Maternity Hospital ; a two weeks' course of observations in which pregnant and postpartum women are examined, labours and incidental operations are witnessed, and daily instruction is given in the wards upon the puerperal state and upon the child.

At the Bellevue Hospital Medical College, and the Medical Department of the University of the City of New York,

much the same system is in use, with the difference that in the latter two institutions the students obtain their practical work by taking the course at the Lying-in Hospital of the city of New York, where the method of instruction differs considerably from that pursued at the Sloan Maternity Hospital.

The essential principle of difference between the two, is that in the Sloan Maternity, instruction in labour is given by observation only—while at the Lying-in Hospital, instruction is given first by observation in the wards, and afterwards by personal contact and responsibility, in the out-door service in the tenements.

This enormous stride toward a perfect system of obstetric instruction has been accomplished within the past six years. And yet the system as exemplified in these schools to-day is so faulty, or perhaps so imperfectly carried out, as almost to neutralise the good calculated to be accomplished by the institution of so liberal a system of instruction.

Prominent among these faults are,—

1. Again the retention in its entirety, of the old system of didactic lectures, the subject matter of which is the ordinary chapters of the obstetric theory. Two things in this regard have impressed themselves most vividly upon the minds of men recently. First, the futility of attempting to teach obstetrics in this way; and secondly, the pathos of seeing a great mind full of knowledge and experience, the head of a department, standing day after day lecturing upon the A B C of the theory of obstetrics.

If the professor covers his subject carefully, all of what he says during the year can be bought in a book for a small sum. What is the system of didactic lectures as practised in this city to-day but a relic of the days when there was no medical literature, when books were few, and knowledge was handed down by word of mouth? It reaches back to the time of Abelard.

But it is contended that if the didactic lecture is abolished, students lose the personal influence of a great mind



fired with enthusiasm for his subject. If the student were permitted to listen to the lecture in an intelligent manner, the contention would be worth considering. He is, on the contrary, transformed for an hour into a mere machine for writing down in a note-book the words which have fallen on his ear. At the end of the lecture he can tell you very little of what has been said, so completely has his mind been occupied in the thoughtless task of note-taking. And what are the notes when finished? Merely a very poor repetition of Playfair, or Lusk, or Parvin, or Winckel. Few men can take notes skilfully. Few men lecture on routine work so well as some man has written. This is the work that should be done in the class-room. There is much left for the lecturer with the influence of his personality. What could be more valuable to the last year student than lectures from the professor of obstetrics upon operative procedures in the treatment of deformed pelves; upon the comparative anatomy of the placenta; upon the physiology of foetal life in the intra-uterine and puerperal period and upon many other subjects which cannot be treated comprehensively in a text-book; subjects about which expert opinion is constantly changing? Such subjects are the operation of symphyseotomy, methods of inducing labour, operative procedures in the treatment of puerperal sepsis, etc.

Here is an opportunity for the student to profit by the wide experience, the deep knowledge, and the personality of the lecturer. Such should be the field of the modern didactic lecture.

A second fault in the present system is the short time granted the student in which to obtain his practical experience in obstetrics. Two weeks is absolutely inadequate for the work. No student can acquire a practical knowledge of the diagnosis of pregnancy, the management of the first stage of labour, the delivery of the head and breech, the management of the third stage and of the puerperium, the diagnosis of vaginal and perinaeal lacerations, and the

care of the child, in two weeks. It can be, at the best, but a smattering, and those are only a few of the things which he should know thoroughly.

But it is claimed that the student has no more time than that to give to practical obstetrics in a three years' course. Possibly he has not when five or six hours are given up each day to the didactic lecture.

Another very serious fault is that in all attempts so far witnessed by the speaker to establish the system of recitations the number of instructors is entirely inadequate.

In one of our leading colleges to-day only one instructor is employed in obstetrics. He must have recitations every day in the week, and his classes must consist of thirty or more men in order to make it possible for every student to appear before him each week. Practical experience has taught every quiz-master in this city that he cannot satisfactorily deal with a class of more than twelve men.

The taint of the old method seems to have vitiated the whole system. Obsolete methods are embodied in the didactic lecture. The didactic lecture, apart from its incongruity with modern methods, commits the error of dealing with the students *en masse* instead of as individuals. In the early days of systematic medical instruction, when the didactic lecture was first brought into use, classes were small, and the lecturer could establish a more personal relation with the individual student even in a formal lecture. To-day we may have audiences of three hundred and more students in the lecture-room. It is here, from the lips of the lecturer, that the student is expected to master the principles of medical science and practise. It cannot be done. It is an absurdity. It is an attempt to employ a system which has long out-lived the conditions which assured its usefulness.

How, then, can obstetrics be taught? The whole structure should be built upon the foundation of the class-room. The student should learn thoroughly the fundamental principles of the art from a text-book in personal contact with an instructor, who shall question well and elucidate. In

connection with the class-room work should be provided a thorough course upon the manikin. The subject can here be studied from the purely mechanical point of view, without considering the human tissues; and a thorough understanding of the mechanism involved in obstetrical problems is absolutely essential to their solution, as well as to the preservation of foetal and maternal tissues and foetal life.

During this time extended touch courses should be given upon the living subject until the signs and symptoms of pregnancy are thoroughly familiar. Then should come the practical work in labour.

This should at first be done in the hospital, and should consist of observation of the phenomena of labour and the course of the puerperal period for mother and child. This work of observation should be done under the constant supervision of an instructor, who shall point out, question, and explain.

Then shall follow the advanced hospital work, in which the student takes charge of several women immediately upon their admission to the hospital. He prescribes for their symptoms in pregnancy. He delivers them in labour, and he manages their convalescence. He is as responsible for these patients as if they were his private patients. This, again, is done under the constant supervision of instructors. During this time he examines patients at the time of their discharge, and thus becomes familiar with the process of involution.

When the in-door service is finished, he should be transferred to the out-door service, in which he has charge of the patients in their own homes. Here the supervision is much less close and the student has practically all the responsibility of the case. He has also to learn, thus early, how to do his work properly in the poorly-equipped homes of the poor, without any of the mechanical conveniences and without the aid of nurses, which are at his disposal in the hospital.

By such a system he will be brought gradually in contact

with the different parts of his work, until finally he assumes complete control and takes upon himself the responsibility of his patient's accouchement. But it is to be reiterated that until the present method of attempting to teach the fundamental principles of medicine by the didactic lecture—a method obsolete and unfitted for modern conditions—be abolished and such work relegated to the class-room, with small sections and a sufficient number of competent instructors, so long will the medical student leave his school with the most essential part of his education unfinished; in many respects unfitted to practise his profession; only fitted to learn *how* to practise from those upon whom he *must* practise.

The two hospitals before referred to deserve more than a passing notice. They are, so far as we know, the first hospitals established in this country solely for purposes of instruction, and for that reason they deserve a most careful attention from all who are interested in the advance of medical instruction.

The Sloan Maternity Hospital was founded in 1888 and endowed for the exclusive use of the students of the College of Physicians and Surgeons. It is at present being enlarged to a capacity of one hundred beds.

During the fourth year of their medical course the students are obliged to spend two weeks in sections of six men in attendance upon the hospital. They make rounds with the house physician every morning, at which time they receive an instruction in the wards upon the puerperal woman and the child. They are called to every labour, and receive instruction upon the phenomena of the different stages. They have no personal care of the case, and their contact with the patient is purely one of observation. On certain days they are also obliged to be present for the examination of pregnant women. At some time during the two weeks they receive instruction upon the manikin from some member of the resident staff. With the increase in the number of beds, the advantage to students will be greatly increased.

The Lying-in Hospital of the City of New York was founded originally as the Midwifery Dispensary in 1890. It was subsequently incorporated with the Society of the Lying-in Hospital of the City of New York. It was founded solely as a school of obstetrics. It is now slowly developing the original plans of its founders. The plan of the hospital system consists of a large central hospital, with in-door patients and a series of sub-stations in the tenement-house districts of the city, from which the out-door service is managed. At present the plant of the hospital consists of a small central hospital at the corner of Second avenue and Seventeenth street, with a service of two to three hundred patients annually, and one sub-station at 314 Broome street, in an out-patient service of two to three thousand labours annually. It is at this hospital that the majority of the students of the Bellevue Medical College and the University Medical College obtain their practical obstetrical experience. The students of many other schools are also enrolled upon its books. The course for undergraduates is two weeks in length. The medical board of the hospital would prefer to give a course of two months, but it is impossible for the students to give more than two weeks to this work. The resident staff of the hospital consists of a house physician and seven assistants, all of whom are expected to act as instructors in their contact with the students. The students are detailed two at a time to duty in the wards. During this time they spend their mornings in ward work under the instruction of the house physician or an attending physician. If a labour occurs the field of instruction is transferred temporarily to the delivery-room. Their afternoons while on ward duty are spent in the examining-rooms of the out-patient department. From sixty to seventy-five women are thus examined during the week. The instruction in the examining-rooms is given by an assistant attending physician, with the aid of the resident staff. It consists of a thorough study of the signs of pregnancy and the measurements of the female pelvis. The students are also carefully



questioned in the class-room in sections of ten or twelve men upon all the practical work which they have witnessed. These recitations are held by the assistant attending physician. In all of this practical work the instructor deals with not more than two men at a time, so that the freest personal contact is insured; and it is thus almost impossible that any point should fail to be understood by both students. After the period of ward work is finished the students are assigned to confinements in the tenement houses. Two students—one a senior in the hospital and one a junior—are assigned to each case. Within an hour after their arrival at the patient's house a member of the house-staff visits the case and gives whatever instruction is possible. The students remain with the case until the confinement is completed. The senior student delivers the patient, assisted by his junior and under the supervision of the staff physician, who so times his visits as to be present at the actual delivery. In this way the student has all the responsibility of the case without any danger to the woman. Each student has at least five or six deliveries during his service. The students are obliged to keep detailed statistics regarding each case, according to the requirements of printed charts provided for the purpose. The work of history keeping is found to be of the greatest value in educating the student to careful, systematic observation.

A point in the routine work of the student at this hospital which is believed by the medical board to be of great importance is the postpartum work done by the students. Every woman is visited twice daily for five days, and once daily for five days by the senior pupil who confined her. At these visits the student is required to note the pulse, temperature, lochia, height of the uterus, breasts, bowels, and general condition of the woman, and wash the external genitals and renew the vulva pad. He also notes the condition of the umbilical cord and other points about the child. In this way he becomes thoroughly familiar with all of the ordinary phenomena of the puerperal period in both mother and

child and the common variations therefrom. It has been found that the only way in which to make the student thoroughly familiar with these phenomena is to make him do the ordinary work of the nurse. He then sees and handles daily the things which otherwise he only hears about from the nurse.

The operations of the service are performed by the attending physician and his assistant. Operative cases of serious character are brought into the hospital whenever possible. Nevertheless symphyseotomies, sections for ectopic gestation, and Caesarian section have been done with perfect success in the filthiest of tenement-house quarters. All operations in the hospital are performed in the operating-room, which is large enough to accommodate all the students in the house. Every operation is made the subject of a careful clinical lecture by the attending physician, and the whole operative procedure is explained in detail.

Two lectures are given each week by the attending physician, one of which is always upon the general subject of puerperal sepsis. The students are also questioned in classroom upon the lectures by the assistant attending physician. All operative procedures, when it is possible, are explained upon the manikin and puppet after the operation.

Such a hospital course as the above briefly outlined, taken in conjunction with the theoretical instruction given in the regular college course at these two schools, places their obstetric courses far among the advance guard in obstetric instruction in this country. And these two hospitals should command the earnest attention and interest of the profession, as leading the way to a better system of medical instruction.

In closing, let me recur to the principal thoughts which I wish to impress upon your minds, for from the great body of general practitioners must come the demand which cannot be resisted—that our medical schools provide instruction which is in keeping with the methods in use in the best lay and professional schools in the world to-day.

The fact which I would most vividly impress upon you

to-day is that there exists among medical men an alarming lack of knowledge and lack of skill in the art of obstetrics. This fact is abundantly proven by the testimony of the gynaecologist and of those engaged in obstetric teaching. This lack of knowledge and skill is filling our homes with invalids, where it is not still causing many unnecessary deaths. This condition is due almost entirely to the inadequate and obsolete methods of instruction at present employed in our schools. When the great body of general practitioners demand that our schools adopt adequate modern methods of instruction, then shall we see the young graduate prepared to do justice to his obstetric patients.

## A DOMESTIC TEST FOR ALBUMINOUS URINE.

By J. G. TRUAX, M. D., of New York County.

*October 15, 1895.*

There are so many known ways for finding albumen, when it is present in urine, that a new one would seem to be superfluous; and yet there are reasons why we should not be perfectly satisfied with the methods now in use.

Let me briefly mention some of the difficulties which we meet with in this work.

Heat coagulates albumen, and precipitates the phosphates, but nitric acid is necessary to complete this test. Nitric acid is not a pleasant thing to carry about on your person, and the means for subjecting the urine, properly, to heat, are not always at hand. Some of these objections apply with equal force to the cold nitric acid test, for uric acid, or the urates will form a ring above the acid, which I have many times known to be mistaken for the white one seen when albumen is present. There is also the inconvenience connected with obtaining the acid.

Another test, to which I will call your attention for the purpose of comparison, and because of its value in making a simple quantitative analysis of albuminous urine, is that one known as the picric acid test. The solution for this test is made by dissolving pure picric acid and citric acid in water in certain quantities, and by a certain method.

This réagent will precipitate the alkaloids and kreatinin which may be in the urine, and has this other objection, that a proper solution of picric acid is not always at hand or easily obtained.

The principal merit of the method for testing urine for albumen, which I shall show you to-day, is its convenience. It is not more reliable, and needs control tests, in order that

we may be certain that what we find is serum albumen, as do the other methods to which I have called your attention.

It is made in the following manner,—a small amount of alcohol is put into an ordinary test tube. Into this is dropped, carefully, some of the urine to be examined. The urine being heavier than the alcohol, will sink quickly to the bottom of the test tube. As it passes through the alcohol, a wave of white coagulated albumen will follow it, if albumen be present in the urine. A considerable quantity will make the mixture cloudy.

That you may be able to compare this with the other tests mentioned, we will make them now in your presence.

We will begin with the nitric acid and heat test. A portion of urine is boiled, and a small quantity (1–10 to 1–20 its volume) of nitric acid (sp. gr. 1.18) added to it. It will be seen that a precipitate forms on boiling,—this may consist either of albumen or of the phosphates. If it dissolves on the addition of acid, it is composed of phosphates; if not dissolved in presence of the acid, and if increased thereby, it is albumen (acid albumen). This test is not to be relied upon absolutely. If little albumen be present, the acid may be in excess and re-dissolve it. When, on the other hand, both phosphates and albumen are present, if the acid used be too little, only a portion of the phosphates may be changed into the corresponding soluble salts, while the albumen enters into combination with the rest, and remains in solution as an albuminate.

Another occasional source of error is the formation of a precipitate of uric acid. This precipitate may be recognised by its deep brown colour, also by the fact that it precipitates as the urine cools. Finally, the test may be misleading in cases when the urine contains a considerable quantity of resinous acids (pine acids), as happens, for instance, after the use of copaiba balsam. These acids can readily be distinguished from albumen by their solubility in alcohol<sup>1</sup>.

<sup>1</sup> Clinical diagnosis, Professor V. Jaksch.



Heat and nitric acid will detect *serum albumen*, and *globulin*, and when the precipitate falls on cooling *albumose*.

"Heller's test." The urine is poured carefully, so as to form a layer on the surface of some nitric acid in a test tube. At the junction of the fluids, a white cloud forms in the shape of a ring, if albumen be present. This test is very delicate, but it is not to be recommended for general use, because, in the case of undiluted urine, the deposition of uric acid is apt to cause a brown discolouration, which may easily be mistaken by the inexperienced for the clouding of albumen. After the use of copaiba balsam, too, a similar ring may form.

"Picric acid test. Ten grms. of pure picric acid and twenty grms. of pure citric acid are dissolved in 900 cc. of water. When the solution is thoroughly cool, water is further added to 1,000 cc., and the mixture is employed as a precipitating agent."

The alcohol test, is the name given to the one to which your attention will be called for the first time to-day. Alcohol is poured into a test tube, until it extends up the tube, from half an inch to an inch. Upon the surface of this is dropped the urine. If the urine contains albumen, a white precipitate immediately appears, and after a few drops of urine have been added, the mixture becomes cloudy.

Should the urine contain mucus, the mixture will have the same cloudy appearance.

This can be removed by filtering the urine before testing it. It is possible that some of the salts may have a similar effect, but I have not been able to ascertain which, if any, do.

There is also another method of making the alcohol test. First, put into the test tube enough urine to fill the tube an inch from the bottom; upon this drop carefully an equal quantity of alcohol. If albumen be present, a white line will form between the urine and alcohol.

Mucus will also show a white line if it be present.

Filter the urine before making the test, and the mucus will be removed.

My claim for this test is not that it is the most accurate, but that it is more simple and convenient than any now in use. It can be made at the bedside. Not even is a test tube necessary. The writer has often used an ordinary glass tumbler. Alcohol can be procured in almost any household at a moment's notice. It is only necessary that it and the glass be clean. The alcohol need not necessarily be pure. The test has revealed the presence of albumen, when the quantity has been reduced to 1-100 of 1 per cent., showing it to be as delicate a test as any we have. It is as certain as any we have, control tests being required by all of them. Its importance will be manifest when we take into consideration the frequency of tests of the urine in general practise. I have used this method of testing urine for albumen for nearly a year. Experience has taught me how to distinguish the coagulum of albumen from that formed by any other substance, or from any deposit or precipitate which may appear in the mixture. This test was suggested to me by a patient, who is something of a chemist.

#### DISCUSSION.

DR. HENRY D. DIDAMA, of Onondaga county, asked for particulars regarding the differentiation between albumen and mucus. He said that as in nineteen out of twenty cases there is no mucus to disturb the reaction, the test ought to prove very convenient.

DR. TRUAX said that if albumen were present, there would be a wave of white coagulated albumen following the urine as it passed down into the alcohol, whereas if mucus were present, the cloudiness would simply spread through the urine until the latter became opaque, —in other words, the mucus did not coagulate so quickly as the albumen. If the alcohol were placed on top of the urine, the ring of albumen would be compact, and that formed by the mucus not so well defined.

DR. EDEN V. DELPHEY, of New York county, asked just what forms of albumen were precipitated by the alcohol, as compared with nitric acid.

DR. TRUAX replied that he had only carried on the investigation with these tests in regard to their action with serum-albumen.

DR. J. W. S. GOULEY, of New York county, said that the title of the paper showed that the test advocated was intended for a "domestic" or home test, and if that were its only recommendation it would be an important one. He had tried the test, and had been well pleased with it as a *domestic* test, but not as a final one.

DR. TRUAX, in closing the discussion, said that he considered this test just as accurate as any of those ordinarily employed, and even more so. He did not think there was any other test quite as delicate, or quite as certain, but of course one could not rely upon any *single* test, whether made at the home of the patient or at the physician's office.

## A CAUSE OF MUCH SICKNESS THAT IS OFTEN OVERLOOKED.

By WILLIAM H. ROBB, M. D., Montgomery County.

*October 15, 1895.*

In assuming the care of any particular person, the first question for the physician to determine, is, what has caused this illness? In answering this question, others are presented. Is it due to organic change in some internal organ, or is it due to some specific poison generated outside of the body? What is the exciting and what the contributing cause? An examination of the patient does not always furnish an answer to these queries. The surroundings of the patient are considered. The house, wash-basin, closet, bath-tub, cellar, sewer-pipe, yard, or even a marsh at some distance from the patient may furnish a clue to the answer to the first question. Conditions might exist in some one or more of these places that would cause sickness. While these conditions do not in themselves generate the specific germ of the disease in question, they do undoubtedly furnish a suitable nidus in which they are developed. You are all familiar with the chronicity and malignancy of the diseases that afflict people who occupy unsanitary homes. In this paper I wish to call your attention to but one of these conditions. The condition referred to is one in which the timbers and flooring of the cellar are more or less affected with "dry-rot,"—a cause of much sickness that is overlooked. By the destructive process of dry-rot the woody fibre is reduced to a pulpy mass or powdery substance. Some think the change due to chemical decomposition or combustion, while others consider it due to the destructive influence of fungi.

In support of the latter theory, I will read you an extract from a letter received a few days ago from Professor Chas.

H. Peck, state botanist at Albany. In speaking of the nature of dry-rot, he says: "It is due to fungus growth, though that may be said to involve chemical action, just as the action of the vital forces of any other organism involves chemical action. One species of fungus which causes dry-rot in timber is *merulius lacrymans*. But there are many other species that do a similar work, just as there are several species that cause rot in our apples and other cultivated fruits and vegetables. The mycelium of the fungus often permeates the tissues of wood and induces decay without developing the external fruiting part of the fungus, hence the difficulty of ascertaining by the unaided vision the real cause of mischief, and it is possible that in some instances bacteria are responsible for it, in which case the ordinary visible fungi would not appear." Favourable conditions for the development of this condition are furnished in cellars that are poorly lighted and ventilated, and that are damp and warm. These are the very conditions that favour bacterial growth. The presence of one species of these microscopic organisms encourages or invites others. They seem to be everywhere. They only need a suitable habitation for their development. Judging from the variety of diseases that are at different times formed in a single house in which is dry-rot, we are led to believe that the specific germs of these various diseases find in this condition a suitable nidus in which they grow and multiply.

From the cellar they migrate into every corner of the house. The air is soon filled with, and poisoned by, them. Living and sleeping rooms are filled with them. Food, water, and air are all affected. Through these sources they are introduced into the human body. Of those who inhabit these homes, the most feeble is the one first attacked by disease. Other members of the family may at different times sicken of the same or other disease. In fact the same person may have at different times repeated attacks of the same disease. In this connection I wish to report the condition of two dwellings in which was found dry-rot destroy-



ing the timbers in the cellar, and the several cases of sickness that followed. These observations were made during a period of two years. Not to burden you with repetition I have concluded to confine my remarks to these two houses, and so far as it was common in both to give you a single picture.

I have designated them as first and second in the order in which the observations were originally made. Both houses were of wooden structure, supported by stone walls, built so as to face the north. The first on the level ground on E. Main St., Amsterdam, the second three and a half miles in the country on elevated land. Neither one of the cellars could be called wet, still a perceptible dampness pervaded the air in both. The bottom of the cellar in each was partially covered with timbers and plank. In the first they were joined and nailed together; in the second they were loose. In the first, in one corner, stood an open wooden cistern, partially filled with water. Unobstructed drains carried off any extra water that might find its way in after rain storms. Both cellars were poorly lighted and ventilated. They were both warm. The timbers, as well as the plank or flooring, were all more or less affected with dry-rot. The air in each was close, musty, and sickening. In the first the foul air seemed to be confined to the cellar. In the second house it permeated the whole building and was detected the instant you entered the front door. No other unsanitary condition was observed in or about either dwelling. In fact, you could attribute the sickness to no other cause. In considering the illness observed in these houses, I shall give the number afflicted in each, the nature of the disease from which they suffered, its duration, and termination. I shall purposely omit detailed accounts of individual cases, as well as the treatment followed. I will say, however, that I believe the treatment was such as might have been endorsed by the Fellows of this Association.

In the first house four cases of illness occurred,—one of cerebro-spinal fever, two of diphtheria, and one of remittent

fever. The attack of cerebro-spinal fever, and both attacks of diphtheria, were of ordinary severity and duration, and all terminated in recovery. The attack of remittent fever was severe from the first, and persisted for eighty-one days. Its termination was due, I believe, to the fact that on the previous day the patient had been removed from the reach of any contaminating air from the cellar. In the second house three cases of illness occurred, one of pneumonia, and two of cerebro-spinal fever. The attack of pneumonia was not severe, but the sickness lasted longer than usual, and after a slow convalescence the patient recovered. Within one week two children sickened of cerebro-spinal fever. Both cases were severe from the first, and terminated fatally within the following week. That the sickness and death as described in either house was due to the unwholesome air that pervaded every corner, and which had its origin, at least, in the decomposing cellar timbers, I firmly believe. The specific germs I think were a later product. I hope and believe that our bacteriologists will soon be able to explain, on scientific principles, the apparent mystery that now surrounds the development of many obscure diseases. By free ventilation, thorough renovation of walls and ceilings, the removal of diseased or decomposing timbers and soil, and by replacing the latter with solid grouting, these dwellings have been rendered practically wholesome. No protracted or fatal disease has occurred in either since these changes were made. Sanitary reform in the first house was enforced in 1880, and in the second in 1888. The number of cases, and the severity of the diseases, that were observed during the two preceding years before any sanitary reform was adopted in these houses, and the comparative freedom from illness that has followed since such reform was made, is sufficient to warrant the assertion that in dry-rot we have a cause of much sickness that is often overlooked.

## DISCUSSION.

DR. A. T. VAN VRANKEN, of Albany county, said that undoubtedly there was much truth in what had been said, but unfortunately many cases of sickness occurred in new houses in which there was no dry-rot.

DR. THOMAS H. MANLEY, of New York county, said that the paper had touched upon a very important point—the aetiology of diseases dependent upon various moulds. There were a thousand different species of fungi, many of which were active factors in disease, even though their exact connection with sickness was not yet well understood. Physicians could not too forcibly impress upon people the importance of keeping the cellar in a sanitary condition. Not long since he had met with a remarkable case of disease due to a mould. He had been called in to see a young woman suffering from thrush, and in spite of everything that could be done, the disease spread down through the trachea, and finally set up a pneumonia. The physical signs had been vague for a time, but the microscope had at once shown an abundance of pneumococci. This patient had been spending a part of the summer in a very unsanitary house in the Catskills. This was the only case of this nature that he had observed.

DR. ROBB, in closing the discussion, said that at the time of the attacks of diphtheria there had appeared to be no possibility of the disease having been brought into the house from communication with other cases of diphtheria. The case of remittent fever was so protracted that he had been led to investigate all possible sources for its origin, and to call to his aid Dr. Harris, then secretary of the state board of health. The outer surface of the cellar flooring in this house looked perfectly good, but by kicking it vigorously, a hole was broken through the plank, and it was then found that the wood underneath was in a pulpy condition. The air from this cellar had a very unwholesome smell. It was at the suggestion of Dr. Harris that the child had been removed upstairs, with the result stated, that the fever had at once ceased. The other house was situated at a distance from the city, on high ground, and with the very best sanitary surroundings, with the exception of the cellar. If the cellar were well ventilated, and in good sanitary condition, the question as to whether or not the house were old was not of importance.

# TENDON GRAFTING.—A NEW OPERATION FOR DEFORMITIES FOLLOWING INFANTILE PARALYSIS, WITH REPORT OF A SUCCESSFUL CASE.

By SAMUEL E. MILLIKEN, M. D., of New York County.

*October 15, 1895.*

Believing this to be the first case reported where a healthy muscle has been made to do the work of one which was completely paralyzed without in any way interfering with its own function, the following details are presented, as the success of the operation speaks for itself. It is a well-known fact that cases of anterior polio-myelitis, where the muscles of the lower extremities are paralyzed during early childhood, offer little encouragement from electrical treatment beyond the development of certain muscular fibres which escaped the inflammatory process; while the mechanical appliances are only employed with the hope of aiding the victim in locomotion and preventing deformities, such as tendinous and muscular contractions and bony displacements. The neurologist and orthopaedic surgeon have learned long ago that, combined with the above conservative measures, so far as offering a cure, it was folly to even anticipate it; thus thousands of cases of infantile paralysis are doomed to the wearing of braces all their lives.

The delay of most two years in reporting this case was for the purpose of allowing sufficient time to elapse without the use of the brace that I might be sure the deformity was permanently relieved.

Joseph H——, nine years of age, came under my observation in December, 1893, and at that time was wearing the ordinary club-foot brace on the right side. The previous

history given was that of the ordinary cases of infantile paralysis. When about eighteen months of age, and quite healthy, the child was attacked with fever which was sufficiently severe to cause him to be put to bed and the family physician called in. The attack was of only a few days' duration, and although apparently recovered so far as the disposition to take nourishment was concerned, it was noticed that the right leg was almost powerless, so much so that the child could not walk. The case was subsequently treated by massage and electricity, and at the age of two years a brace was applied which enabled him to walk.



FIG. 1.—A, showing tendon of extensor proprius pollicis; B, showing tendon of tibialis anticus.

EXAMINATION.—When I first saw the case, on removing the brace with the patient sitting on a chair, it was easily seen that the trouble was with the anterior tibial group of muscles, as the right foot dropped into the position of equinus.



On attempting to voluntarily flex the foot on the leg, all the toes were seen to respond, but the whole foot was forced into extreme valgus. This led me to conclude that it was the innermost muscle of the group, viz., the tibialis anticus, which was mostly, if not solely, involved; this muscle, from its prominent position in a healthy condition, antagonizes not only the peroneal group, but the tibialis posticus as well. Owing to the paralysis of the tibialis anticus the power of

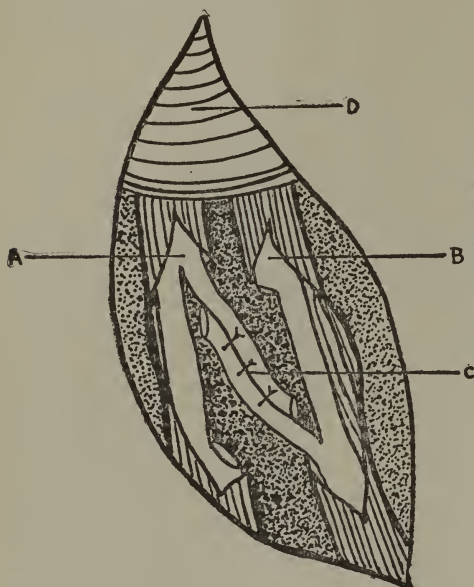


FIG. 2.—A, tendon of extensor proprius pollicis; B, tendon of tibialis anticus; C, flaps united with interrupted sutures; D, annular ligament of ankle.



FIG. 3.—Showing sheath of the tendons united with continuous suture.

flexing the foot on the ankle was limited to the three remaining muscles of the group, viz.: the extensor proprius pollicis, the extensor longus digitorum, and the peroneus tertius, which, from their distal attachments, were of little use in this direction; while, on the other hand, in the absence of such an important antagonist it is easy to account for the extreme valgus into which the foot was forced. In addition to the

above deformity there was a marked "hammer toe," due to the over-exertion of the extensor proprius pollicis. An electrical examination only verified the above, and as the anterior tibial nerve supplied all four muscles, it was decided to take part of the extensor proprius pollicis tendon and graft it into the tendon of the tibialis anticus, which was paralyzed.



FIG. 4.—Showing adduction of right foot following operation.

OPERATION.—On February 14, 1894, under ether anaesthesia, an incision one and a half inches long was made, extending from just below the annular ligament obliquely over the tendons of the extensor proprius pollicis and tibialis anticus. (See Fig. 1.) The sheath of each tendon was carefully opened for a distance of about one inch. The tendons were then split with a small Adams fascia knife, and an inch flap taken off of each. The flap from the tibialis anticus, of course, being left attached to the distal, while that from the

extensor of the great toe was attached at its proximal or muscular end.

Before incising the tendon of the extensor of the great toe, it was pulled down by means of a blunt hook, so that a flap could be gotten as high up as possible. This was done for two reasons: 1st, so as to relax the tendon, thus relieving the "hammer toe," and 2d, so as to insure the action of the exten-

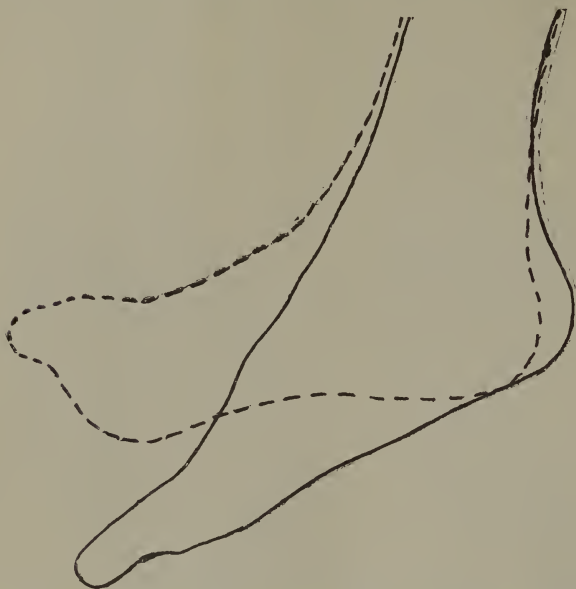


FIG. 5.—Showing Voluntary Flexion of Right Foot following Operation.

sor proprius pollicis on its new insertion if union was obtained. The cut surfaces of the flaps were adjusted and sutured with three fine kangaroo tendons interruptedly (Fig. 2). The outer flap of the sheath of the extensor proprius pollicis was then sewn to the inner flap of the sheath of the tibialis anticus (Fig. 3), with a continuous suture, so as to prevent the newly united tendons becoming adherent to the overlying structures, thus making a new sheath which would not interfere with the action of the muscle which was to do its own work and that of the one which was paralyzed.

The skin was closed with fine interrupted catgut-sutures and dressed aseptically. The foot was immobilized with a plaster-of-Paris splint, the deformity having been previously corrected by manual force. The case progressed uninterruptedly, and it was dressed for the first time on the tenth day, a window being made over the wound in the plaster for that purpose. The catgut-sutures had been absorbed, but the skin had not united primarily, as I had hoped it would; however, there was no pus, nor had there been as much as one degree elevation of temperature since the operation. The non-union



FIG. 6.—Showing Voluntary Flexion of Left or Normal Foot.

was caused by the pressure of the plaster-of-Paris splint which had been put on rather snugly. Under balsam-of-Peru dressing the skin wound healed in ten days. Every day for three weeks after the operation gentle passive motion of the great toe was made, so as to prevent the tendon becoming adherent to its sheath. The foot was kept in a plaster-of-Paris splint for six weeks, when a very light brace with a limited joint at the ankle was applied. The immediate improvement in the case was even noticed by the parents, as the foot no longer became abducted when an attempt was made

to raise it, such having always resulted before the operation was performed. It is now five months since the brace was left off altogether, and although there has never been any electricity or massage employed, the boy has been encouraged to take all the exercise possible. He is now quite an expert on roller-skates, walks without a limp, and can adduct the foot to almost normal (Fig. 4). There is still a slight "hammer toe" on extreme flexion of the foot, but nothing as compared to the condition before operation (Fig. 5), while flexion of this foot on the leg is almost as good as the unaffected side (Fig. 6).

My other work in this line is so recent as to prevent further report of cases at present, but I think with this excellent result the field has been opened for tendon grafting in these otherwise hopeless cases of infantile paralysis.



## EXCISION OF A TUBERCULAR ELBOW IN A CHILD WHICH HAD RESULTED IN ANKYLOSIS WITH SINUSES. DISEASE CURED AND MOTION RESTORED.

By SAMUEL E. MILLIKEN, M. D., of New York County.

October 15, 1895.

Excision of any joint during childhood should be done only after less radical measures have failed to give relief; however, the elbow does not offer the same objections as the joints of the lower extremities.

An endeavour should be made to obtain a movable elbow, even if the growth of the limb is interfered with; a flail joint here after excision is rare as compared with the lower extremity.

*Indications for Excising the Elbow in Children.*—1. Tubercular disease which has not subsided under careful and continued mechanical treatment, arthrotomy having failed to give relief. 2. When the joint is ankylosed in a faulty position. 3. Persistent sinuses due to tubercular bone disease.

In the first instance we should consider the fact that any local tubercular lesion is apt to infect the whole system, as is evinced by the frequent deaths from tubercular meningitis in cases under treatment for a diseased joint. Owing to the structure of the elbow joint, it is readily understood why a partial excision does not offer a very favourable prognosis, as it is of great importance that we should remove every focus of disease.

The following case illustrates some of the obstacles met with in excising the elbow joint:

On December 20, 1894, at the Children's Hospital, Randall's Island, I operated upon Samuel M., five years of age, who had had two or three partial arthrectomies performed, and not only

did the sinuses continue, but the elbow was ankylosed as well. Under ether anaesthesia, through a single posterior incision the periarticular structures and periosteum were separated; but it was found necessary to chisel through the olecranon so as to bring the ends of the bones well into view and prevent the soft parts being injured by the saw. So far as possible, the operation was done subperiosteally, but the existing sinuses on the anterior and posterior surfaces made it tedious. After the ends of the bones were removed, it was found that a sinus on the anterior surface of



FIG. 1.—Showing voluntary flexion ten months after complete excision of the elbow for relief of ankylosis and sinuses due to tubercular disease.

the arm led down to a focus of disease in the coronal depression of the humerus.

It is necessary here, as with other joints, that every fragment of tuberculous tissue be removed, else the operation will avail little or nothing.

*Dressing.*—The wound was packed with iodoform gauze, extending through the joint, and the forearm put up at a right angle with the arm in a plaster-of-Paris splint. The wound in the anterior surface of the joint was allowed to close, while the packing through the posterior wound was continued for the purpose of drainage and to

prevent the ends of the bones coming in contact, with the hope of obtaining motion. Although it was clear that motion in the joint was being restored, it was necessary to curette the sinus on the posterior surface some months after the operation before perfect union of the soft parts was effected. At regular intervals of forty-eight hours, following the primary excision, passive motion of the joint was practised, the plaster-of-Paris splint having been cut down so that it could be removed for that purpose.

*Result.*—It is now almost ten months since the excision was made, and, in addition to having relieved the joint of all tubercular disease, almost normal motion has been restored, as the boy



FIG. 2.—Voluntary extension after excision of left elbow.

can flex the elbow to seventy degrees (Fig. 1) and extend it to one hundred and seventy-five degrees (Fig. 2), giving a range of motion of one hundred and five degrees. Although the upper ends of the radius and ulnar were removed, the arm can be voluntarily pronated and supinated, though yet limited.

*Conclusions.*—1. Excision of the elbow for tuberculous disease complicated by ankylosis and sinuses, to be effective, must be complete.

2. The single posterior incision is preferable even in complicated cases.

3. When possible, the operation should be done subperiosteally, which gives a stronger joint, as all the ligaments are left intact and the subsequent haemorrhage is lessened.

4. Gentle passive motion at regular intervals is essential to the restoration of motion.

5. Cases of excision of the elbow should be under the surgeon's care for six months at least after operation to insure the best results.

#### DISCUSSION.

DR. ZERA J. LUSK, of Wyoming county, said that the author of the paper was to be congratulated on his technique, and on the remarkably good result obtained in the relief of such a serious deformity.

DR. A. B. JUDSON, of New York county, said that he had been greatly interested in the cases presented by Dr. Milliken. He thought the reader of the paper was quite right in saying that many cases in orthopaedic practise were condemned to wear apparatus all their lives. This was not necessarily any discredit to this branch of surgery, because it was prosthetic, but it should be borne in mind that when worn for many years during the period of growth, the patient was able to bring into active use certain groups of muscular fibres which would be always inactive and undeveloped if the brace were not worn. In the tendon grafting case Dr. Milliken had accomplished what orthopaedic surgeons ordinarily endeavoured to do by apparatus alone.

DR. MILLIKEN said that braces were of the greatest assistance to the orthopaedic surgeon, but unfortunately these cases of infantile paralysis, unless very mild, were compelled to wear these braces all their lives if not relieved by an operation of this character.

## MILK AS SUPPLIED TO LARGE CITIES.—THE SOURCES AND NATURE OF ITS CONTAMINATION.

By LEROY J. BROOKS, M. D., Chenango County.

*Read by title, October 15, 1895.*

New York city receives a daily average of 822,000 quarts of milk, or 300,000,000 quarts per year. It receives it from widely varying sources, extending from the immediate vicinity of the city to a distance of from three hundred to three hundred and fifty miles. The constantly increasing demand has entirely changed, not only the sources of supply, but the methods of supply, and really the methods of production, and the product itself. The city of New York appoints its five inspectors, who inspect the product after it reaches the city, and whose labours necessarily result in but little more than in getting an estimate of the proportion of solids in the milk to the liquids; in other words, the amount of water added to the milk. If we can judge of court records, of the 1,400 arrests made during the past five years for adulterating milk, 1,300 of them were for "watering" milk, and the balance for lack of cleanliness and other offenses. The law of the state of New York requires that milk shall contain fourteen per cent. of solids, of which three and one half shall be butter fats. So long as the dilutent consists of water, the disproportions can be readily demonstrated by the ordinary tests, but it will be shown that there are methods of adulterating milk, equal violations of the law, that are not detectible by these ordinary methods, and that there are other sources of adulteration and contamination of the product more serious in their nature and more dangerous to health and life, that inspectors do not reach nor recognise.

The usual method of obtaining the supply is that it is brought



to the stations along the railroads by the producer, in cans holding forty quarts. It is here, generally in the same cans, placed in vats of ice water, where it remains until shipped in the cans, or it is bottled and thus shipped. The milk remains at the station a varying length of time, according to the urgency or slackness of demand. If the demand is urgent, it is received at night and shipped at noon of the next day; more frequently it is shipped the next morning, making it twenty-four hours old before being shipped, at the shortest time, and not infrequently kept to forty-eight to fifty-six hours before shipping. Inasmuch as it takes twelve hours in transportation from the farther stations to the point of delivery to consumers, it results in the milk being from thirty-six to fifty-two hours old at the time it is received. A portion of the milk is passed through a milk separator or set in pans for the collection of cream, which is shipped as such, or if any balance is left, used for making butter. The milk is shipped in cars constructed for the purpose, the temperature in the car generally being held to about fifty degrees.

These details are given for the purpose of explaining facts to be shown later.

In order to classify the subject, we will consider the sources of contamination that arise:

1. From the condition and diseases of the cow.
2. From the character of the food.
3. From sanitary surroundings.
4. From sources connected with the station.
5. From transportation to New York, and return of cans.
6. From treatment of milk after it reaches New York.
7. From the milk as media for carrying or developing a centre of infection.

1. *The cow*.—A fact contrary to usual statements of veterinary works has been demonstrated by Dr. E. F. Brush, that the average temperature of the milch cow is  $103^{\circ}$  to  $103\frac{1}{2}^{\circ}$ , and when in heat  $104^{\circ}$  to  $104\frac{1}{2}^{\circ}$ . This is of especial importance because many diseases, the normal temperature of which—if one may speak of the normal temperature of

disease—is not higher than the normal temperature of the animal, may exist indefinitely without marked physical evidences or serious apparent deterioration of the health. It is only when the diseased condition exists in, or is transferred to, an animal or being of different normal temperature from temperature of the disease, that its physical manifestations markedly appear. This leads to milch cows being retained in herds, laden with disease, month after month without apprehension. This is believed to be particularly true of tuberculosis. It is only in the advanced stages, when the glandular implication or destruction of tissue, with other coincident, septic influences, exists, that this disease becomes sufficiently marked to excite the attention of the average dairyman. There is the fullest evidence that it is common for cows, with active tuberculosis infiltrating every part of the body, to be milked and the milk used for human food until the ravages of the disease cut off the supply. This subject has been too thoroughly discussed and investigated to question, but that such milk becomes a most dangerous food,—and inasmuch as it is not the object to discuss tuberculosis—we will only present the more recent conclusions:

1. That tuberculosis is communicated to the human subject by means of milk from cows possessing the disease.

2. That under susceptible conditions the disease is brought into the human system by the milk where there exist no local lesions.

3. It is far more likely to exist in milk, if there are tubercular lesions in the milk duct glandular tissue, or in the udder of the cow.

It may be wisely considered whether or not the close approximation of the normal temperature of the cow to the average early temperature of typhoid fever does not mask actual cases of this disease among milking cows, or at least, until the intestinal lesions and exhaustion of the later stages have appeared. It must be remembered that the temperature of the cow not being markedly elevated, the other physical signs of the disease are slower to manifest them-

selves. Veterinarians, if I may judge from their published works, do not recognise a specific typhoid fever in cattle, and yet a practical veterinary physician called my attention in 1895 to cases occurring in the months of August and September, during the prevalence of typhoid fever, characterised by lassitude, loss of appetite, slight temperature elevation, that were milked for shipment until a diarrhoea developed and cut off the milk supply. It should be also impressed that the farmer's living depends upon the amount of milk he gets from the farm, so that many are slow to call attention to anything likely to take one producer from their herd. Further, state inspectors seldom have their personal attention called to herds except in unusual or extreme cases, or to milk when at the factory. The typhoid bacillus, not producing change in the appearance of milk, or its tests, is easily concealed from the inspector.

While it is doubtless true that the bacillus may exist in the milk, either from extraneous sources, such as diluting the milk with water containing it, washing the cans with such water, by direct infection from being placed in a typhoid atmosphere, by being in personal contact with a typhoid patient, or by the indirect method of the cow drinking the water, so many epidemics of typhoid fever have occurred in all parts of the world, originating from the dairy, that it seems important that a more thorough investigation should be made of the subject by the medical profession.

Professor Huedenkoper made investigations concerning anthrax, that confirm the suggestion that diseases thrive more readily at definite temperatures peculiar to the disease itself, than at other temperatures. For instance, the chicken, whose normal temperature is from 104° to 105°, must be placed in cold water, after inoculation, in order to reduce the temperature 2° or 3° before the destructive activity of anthrax manifests itself; and frogs with normal temperature at about 95° must be placed in a warm bath until the temperature is raised several degrees, in order to produce an active development of the bacillus.

Anthrax has been unusually prevalent during the summer of 1895, owing doubtless to the dry conditions of the pastures, and the scarcity of food compelling the cattle to browse in the swampy sections. Less may be feared from this source than from many others, because the destructive action of the disease quickly suppresses the milk, and takes the life of the animal.

A not infrequent source of contamination is in using milk within a short time after calving, while the system is going through the usual puerperal conditions. As contrary as this is to law, and nearly all milk contracts, there are a large number of producers who count "milk as milk," particularly if it goes away from home three hundred miles.

An inspector of my acquaintance, suspecting the appearance of blood in the milk of one of the best patrons, made an investigation quietly, and found that he was supplying milk from cows whose offspring were but two days old.

Inflammatory or febrile conditions, mastitis, diseases of the udders, suppurating glands, abscesses, etc., produce changes in milk that are generally recognisable by appearances, and are designated by farmers by various names, such as "curdly milk," caused also by overheating by any cause; "bitter-sweet milk," more frequently due to conditions produced by improper feeding; "slimy milk," that which can be drawn out in ropy fibres; "blue milk," showing, a few hours after milking, indigo blue spots, produced by some micro-organism; "bloody milk," from diseases of the udder, and other common names.

This milk reaches the milk station, unless prevented by the most careful inspection, and this inspection is usually given only by special dealers, who themselves supply the consumers, direct. There has been reported in western New York, Ohio, and North Carolina, a peculiar disease that has been designated as "milk-sickness." A spirillum exists in the blood. There are scarcely any constitutional symptoms in the cow, the poison being eliminated by the milk, and the milk proving fatal, in many instances, to consumers.

In the summer of 1894, an epidemic occurred near Norwich, at which about forty people were ill, developing in families supplied by one milk dealer. The symptoms were severe, persistent vomiting, colicky pains, faintness, collapse, and, in a few instances of children or weak patients, death after a few hours. A careful inspection of the herd, stable, and pasturage, failed to account for the disease. The epidemics described in Ohio and western New York are so similar as to suggest the same specific cause.

The character of the food has a great bearing upon the quality of milk. The ideal food for summer is a pasturage with clover or good grass, and supplied with an abundance of pure water, and in winter with clean, sweet hay, with the addition of bran, and perhaps some corn feed. The crowding system, however, now in vogue, in which the farmer endeavours to get the largest supply of milk possible, regardless of all other conditions, has led to the use of many forms of feed that are pernicious, both to the milk and the cow. Careful investigators state, that, by the present method of feeding and care of the cow, the milking life of the cow is reduced from the old standard of ten years to three years, as the outside limit. After that time the cow grows thin, weak, the milk gradually disappears, frequently a cough develops, and, in fact, we have a beginning consumption. The enterprising farmer turns this cow into a rich pasture until improved, then sells it for prime beef.

The danger to milk lies in the development of constitutional diseases of the cow, such as scrofula, liver and kidney disease, that make serious alterations in its quality. Certain cultivated fruits and vegetables may be the source of much trouble, as apples, turnips, cabbage. Feeding for an abundant milk supply with highly nitrogenous foods, such as cotton-seed meal, wet or dry barley sprouts, brewery or cider-mill refuse, or distillery grains, rich oils, ensilage, gluten meal, while it accomplishes its direct result, certainly has a damaging influence upon the quality of the milk, not by lessening the per cent. of solids, but by intro-



ducing ferments which produce rapid change in the milk, and developing elements that are intensely irritating, especially to the intestinal tract of infants. While a personal letter of the health board of this city states that milk from cows fed on ensilage, if such ensilage be properly prepared, is used largely in the city, and not harmful for any purpose, such an opinion is against the evidence of a large number of judicious observers and practical milkmen. So firm is this conviction that milkmen, who supply the higher grades of customers, refuse to accept at their stations any milk produced from this feed. Herbs and plants, such as *colchicum autumnale*, *lobelia*, *rhys toxicodendron*, etc., will often result in poisonous milk.

It is only till very recently that any attention has been paid to the hygiene of the cow, so far as pertains to the barn and its surroundings, and as yet there are but few barns constructed with ideas of ventilation in proper proportions to supply a constantly renewed supply of fresh air during the winter; still no measure has more to do with the health of the cow than this. A few special firms are now exacting proper barn construction, scrupulous cleanliness of the barns, cows, and milkmen; but the majority of the milk brought to stations is taken in filthy barns, without any attempt to clean the cow. In the fall and spring, especially, the cow enters the barn wet from the storms, and gentle streams of water trickle down the cow's back, along the bag and udder into the milk-pail, added to by the drippings from the milkman's clothes, and the accumulations on the milkman's hands; strained through straining cloths that have been indifferently washed, until it contains an amount of filth that "to be hated, needs but to be seen." Under the more recent directions it is generally cooled within an hour, at the barns, or houses, in the cans, then delivered to the stations.

We have previously referred to the process of cooling the milk at the stations, and stated that the temperature of the milk in the vats was kept at about forty-five degrees. So long as the milk is kept cooled to this temperature, it matters

little whether it be clean or filthy, and one kind reaches the user as sweet as the other. The process of early and prompt expulsion of the animal heat, by cooling, is of great value, and the milk, if pure and clean, will keep longer after delivery than if delivered directly from the cow. On the other hand, it is easily demonstrated that if the milk is filthy, after the removal from the ice, the fermentive changes are more rapid and decided than if not previously subjected to the prolonged cooling. In some recent observations in this city, milk received at 10 a. m., frequently became sour and unfit for use at 12:30 or 1 o'clock.

It has also been observed, in many instances during the last summer, that where the milk comes from the farther stations, and not properly cooled, that it becomes sour before it reaches its destination.

At the milk stations portions of the milk are passed through a separator in order to obtain cream, either for shipment as such, or for butter. In many stations it has been found that this offers an opportunity for adulteration not easily recognised. If the milk is above the required standard of 14 per cent. solids, skim milk is added to reduce it to the standard. We do not know that this makes any difference, if the two portions of milk are the same age, but experiment shows that, if they are of different ages, which often occurs, the product is much more liable to fermentive changes.

The separator offers a most excellent opportunity to demonstrate the amount of filth in the milk when received at the stations, inasmuch as the milk separated is taken from the same supply sent to New York. In these ingenious machines the cream is first thrown off, then the skim milk, while the refuse or heavier material remains in the cylinder. This latter material is a composite one, and consists not only of the external foreign materials mingled with the milk globules, but of other elements that come from the economy of the cow.

The average composition is as follows :

Water.....	67 per cent.
Fat.....	1 per cent.
Casein.....	25 per cent.
Organic material.....	7 per cent.

I exhibit here specimens obtained from different milk, when ready for shipment.

Dr. G. O. Williams, of Greene, N. Y., a skilled microscopist, reports the following material shown in a portion of this mass :

Milk cells, pus, and an abundance of blood, shreds of febrin, antennae of insects, faecal masses, particles of soil, vegetable shreds, epithelium, and he suggests possibly scabs from cow pox.

The amount of this material, separated, varies with different seasons and dairies, and probably with varying conditions of the cows. A few records will be of interest :

1	amount of milk,	3,600	quarts,	refuse	20	ounces.
2	" " "	1,400	"	"	10	"
3	" " "	100	"	"	4	"
4	" " "	240	"	"	6	"
5	" " "	1,600	"	"	7	"

While probably not more than from four to seven per cent. of this is actually foreign to the milk, it is positive that a much larger per cent. depends upon unhealthy conditions of the cow, and together furnishes an alarming amount of poison to be distributed among milk drinkers.

#### CANS.

A very serious source of contamination exists in the milk cans. In most instances, at the larger stations, they are washed at the stations with all reasonable care, but here, as elsewhere, it depends largely upon the natural neatness and faithfulness of the attendant, many being found in conditions unfit for use. In our investigations, however, we have found the most alarming feature to be the condition of cans as returned from New York to the milk stations. A few dealers clean the cans as they reach the New York sta-

tion to be returned, but the majority are shipped just as received from the consumers. In order to confirm my own observations I asked the physicians, living near the milk stations, to investigate, and answer the following questions:

1. Number of cans inspected?
2. Condition on return from New York?
3. Character of refuse, if any?
4. Method of washing the cans?
5. Are cans washed at station, or by patrons?
6. Do you regard the cans as washed effectively for the destruction of bacteria and fermenting material?
7. What per cent. of cans, in use, do you regard as unfit for conveying milk?

#### ANSWERS.

*Question 1.*—The total number inspected was about 1,000.

*Question 2.*—Condition of cans belonging to certain firms, clean. The larger proportion of cans filthy, some of them very filthy.

*Question 3.*—Character of contents. The larger proportion contained the remnants of the former contents, such as sour milk pot-cheese, than which no viler material exists, and similar materials. A large number contained the most varied and filthy mass, and I only need to mention some of the most prominent.

One can contained a dead cat.

Eight contained human faecal matter and urine.

Two contained rotten eggs.

Two, horse manure.

Two, masses of decayed and maggoty meat.

One, a bundle of clothes full of filth and vermin.

One, sweepings of a floor and other filth.

Twenty-five or thirty, restaurant refuse, such as stale bread, cabbage and other vegetables, clam-shells, stale clams, etc.

This report is from the result of one week's inspection, and each reporter gives the assurance that the above is "only a sample."

*Question 4.*—Cans were washed at the larger stations by being placed in a solution of sal-soda, and scrubbed inside and out with brushes, then placed over a jet of steam under pressure, varying in temperature. In the smaller stations they are washed with soap and water and rinsed with cold water. The patrons generally use the same process when the cans are washed at home.

*Question 5.*—About 75 per cent. of cans are washed at the stations.

*Question 6.*—Effectiveness. The cans washed at larger stations are generally cleaned sufficiently to destroy all odour or bacteria. Three stations were reported as doing the work carelessly and indifferently, and not sufficient for the purpose. The greatest complaint was made where the cans were washed at the homes of patrons, and many instances reported of the greatest negligence and lack of proper care. About five per cent. of all cans inspected were regarded unfit for further use.

This answer varied from two to ten per cent.

One further source of contamination demands reference. Shipping milk in bottles, under proper conditions of care, is deservedly popular, but my attention has been called by dairymen in New York city to a method carried on in New York, especially by small dealers. A route having been established, the dealer buys the milk in the market in cans, then takes it to his stables, or home, or other convenient place, and bottles it himself. One called to my attention used the stables occupied by his horses; another, the kitchen of his own house. With the imperfect facilities for caring for the milk or cleansing the cans, the careless selection of the supply, the escape from inspection by the milk having been inspected before being bottled, there is an abundant source of evil, requiring a closer watchfulness on the part of the authorities.

The paper has been so tediously prolonged that we will make but a brief reference to the last proposition,—milk as a medium for carrying, or developing centres of, infection.



Professor Vaughn's investigation and demonstration of the ptomain tyrotoxin, has been so well accepted by the profession that it needs nothing more than a reference, and the suggestion that the filthy cans may be responsible for the presence of the poison in many instances.

Literature is now crowded with detailed histories of epidemics of typhoid fever, scarlet fever, diphtheria, and small pox, in which milk acted as a developing centre and transmitter. We need not discuss this phase of the subject at greater length.

#### SUGGESTIONS.

1. That milk inspectors, outside of New York, should be required to possess other qualities than "political pull."

2. That the medical profession should personally investigate the sources of milk supply, and unite in their efforts to suppress the evils.

3. That absolute health of the cow, most careful selection of food, the most thorough cleanliness of the cow and its surroundings, perfect hygiene, scrupulous care of carrying vehicles, are essential for the production of healthy milk.

4. That a law should be passed, if one does not already exist, forbidding any foreign material in milk cans after the milk is removed, under severe penalties, and compelling every can to be cleansed before being shipped from New York to the milk station.

5. The method of bottling milk in the city from cans obtained from the general milk supply, should, if not absolutely forbidden, be most rigidly watched.

6. It is believed that filtering milk, either after the manner of the Copenhagen Milk Supply Co., or through layers of pure absorbent cotton, when the milk is first brought to the stations, would add greatly to its purity.

7. Experiments have shown that oxygen, forced into the milk under pressure, destroys bacteria, and increases the keeping power. It is stated, on good authority, that milk so treated will keep months without chemical change. Experiments in this direction may develop methods of great value.

8. Sterilisation of milk, which changes the casein, liquefies the fat, coagulates the lac-albumen, and destroys the starch digesting ferment, and alters the taste, renders the milk less digestible, should not be accepted as a substitute for, nor be expected to overcome the dangerous qualities of, milk from conditions above described.

9. The number of milk inspectors in New York is entirely inadequate to meet the requirements, and there should be a larger number and their field of duty should be greatly enlarged.

## SOME UNUSUAL CASES OF ORBITAL TUMORS EMPHASISING THE NECESSITY OF CARE- FUL DIFFERENTIAL DIAGNOSIS.

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*October 15, 1895.*

### ABSCESS OF THE ETHMOID CELLS.

CASE I.—On August 23, 1886, a woman aged twenty-seven was sent to me, in the country where I was staying, for my advice for some trouble with the left eye, which had existed for some months, and which had occasioned her considerable anxiety because of her family history. She was a single woman, in apparently perfect health, and on casual inspection there seemed to be nothing the matter with her eyes. She had first noticed a slight fullness of the inner end of the left upper lid, unaccompanied by any subjective symptom. This slight swelling had increased very gradually, but without either pain or redness. Within the previous week she had become conscious of a dull ache in the orbit. A careful examination revealed the presence of a small, hard, resisting lump at the upper and inner angle of the orbit, just above the lachrymal bone, which pushed the lid before it. It seemed to be firmly attached to the periosteum of the orbit by a rather broad base, but I could trace no farther prolongation of the growth into the orbit. The lid was freely movable over it, and the tumor was painless and non-sensitive. There was no exophthalmos and no limitation of the mobility of the eyeball in any direction. The growth was the size of a small cherry, and while hard and resisting to the finger, it was not as hard as bone. There was no interference in the functions of the eye. The patient was slightly hypermetropic, with normal vision and normal visual field, and the ophthalmoscopic examination was absolutely negative.

The family history was peculiar and apparently significant. The paternal grandfather had suffered from extensive lupoid disease of the nose and cheek in his old age. The patient's father had had an epithelioma of the right external canthus, involving both lids, which had been removed by excision on two different occa-

sions, and had returned in the cicatrix and now involved both the orbital tissue and the eyeball. One of her father's sisters had died from cancer of the breast after two operations, and another was suffering from cancer of the uterus. There was no syphilis in the family.

The patient had been troubled with naso-pharyngeal catarrh for several years, but the secretion was slight except when she caught cold. A careful rhinoscopic examination showed a moderately thickened and succulent mucous membrane in the anterior nares and about the inferior turbinated bones, but there was no pus and no evidence of any disease higher up in the nasal cavity. From the clinical symptoms and the family history, a diagnosis was made of probable orbital sarcoma, starting from the periosteum of the orbit, and the patient was advised to submit to an immediate operation, as the small size of the tumor promised an easy and thorough removal. This she declined to have done, and I saw nothing of her for a period of three months.

The condition was then found materially changed. The eye protruded perceptibly from the orbit, and was pushed downwards and outwards as well as forwards. The tumor was very prominent, had increased considerably in size, and extended well back into the orbit along the internal wall. There was a constant dull pain in the orbit and frontal region, and the patient complained of a stoppage of the left nostril. The tumor, though still firm and resisting, did not seem as hard as it had been three months before. The middle and upper nasal meatus on the left side seemed occluded, but no positive neoplasm was demonstrable. The patient had become very nervous and anaemic, but apparently from anxiety alone, as she confessed that the pain was not severe but merely annoying. The patient had crossed diplopia from displacement of the eyeball, but the vision of each eye was normal and the ophthalmoscopic examination was again negative.

She now consented to an operation, which she was told would necessarily be more serious and extensive than at first suggested, and that it might prove necessary to remove the eyeball before the tumor could be reached; but that the eye would be preserved if possible. She entered the hospital and two days later the operation was performed, and the result proved an entire mistake in the diagnosis. A curved incision was made entirely through the upper lid and tarso-orbital fascia, just below the superior orbital margin, from the middle of the lid inwards to the median line of the nose, and the cavity of the orbit freely opened. Through this

opening the tumor was easily reached, and was found to extend far back along the inner wall of the orbit. In endeavouring to separate it from its attachments with spatula and strabismus hooks, its capsule was ruptured, a large quantity of foul pus was immediately evacuated, and the tumor collapsed.

A careful examination showed that it had been an abscess of the ethmoid cells. The inner wall of the orbit had disappeared by suppuration and absorption, and the body of the ethmoid was one large cavity. The lachrymal bone was immediately punctured, a free opening through it made, and then communication was made with the superior and middle nasal meatus by breaking down some thin, bony obstructions. Pus soon appeared in the inferior meatus, and free irrigation was then at once made through the ethmoid cells by syringing with a warm bichloride solution. This was continued until the fluid dropped clear from the nostrils. The wound in the orbit was then carefully washed out, a drainage tube introduced well into the ethmoid cavity, and cold dressings applied. As soon as the patient had regained consciousness, she was placed in a sitting posture in bed, and kept in this position for three days. The ethmoid cavity and nostril were irrigated twice a day with the antiseptic solution, and on the fourth day the drainage tube was removed. There was little or no reaction, the purulent discharge rapidly subsided, the wound granulated from the bottom, and in two weeks the patient was discharged. At the end of a month the diplopia had disappeared, and there was only a trace of exophthalmos left.

In this case, the mistake in diagnosis was due to the appearance and feeling of the tumor, to the absence of all signs in the nose at first, and to placing too much importance on the family history of cancer.

#### ADENO-SARCOMA OF LACHRYMAL GLAND.

CASE II.—In May, 1889, a gentleman, aged thirty-five, was sent to me complaining of an annoying excrescence of one of his lids, as he called it. An examination showed a protrusion of the outer angle of the left upper lid of considerable extent, and a slight displacement of the eyeball downwards and inwards. On everting the lid, a dark red lobular mass presented itself, which occupied the upper and outer angle of the orbit and seemed to be firmly attached to the periosteum. It was closely applied to the eyeball and appeared to extend some distance back into the orbit. The tumor was hard and non-sensitive and occupied the site of the lachrymal gland. It had been growing for more than a year, but had occa-



sioned no pain, and had only recently become annoying. It was freely movable over the eye, but was firmly attached to the bone. No family history of any significance was elicited. A diagnosis was made of tumor of the lachrymal gland,—probably malignant—and the patient was advised to have it removed immediately, before any further extension to the orbital tissue, and to this he consented. The operation was done at his residence, as follows :

Under ether anaesthesia, the external canthus was freely incised for about an inch beyond the canthus, and the superior canthal ligament divided. The upper lid was then everted and held in place by a tenaculum in the hands of an assistant. The tumor was then seized by a double tenaculum and put upon the stretch, and was then rapidly separated from its loose attachment to the eyeball, care being taken to avoid opening the sheath of the external rectus muscle. The tumor extended some distance backwards into the orbit, and its under surface was flattened. The adhesions to the periosteum were very firm, but with care and patience the gland was removed intact. The upper cul-de-sac was then incised and the accessory gland in the upper lid was dissected out. The cavity was then irrigated, and a careful examination was made of the orbit to discover the presence of any diffuse or circumscribed infiltration. Nothing was found, and after a second careful irrigation, the incision in the conjunctival cul-de-sac was closed by three fine sutures, and the eye closed under cold antiseptic dressings. There was no suppuration, the case healed rapidly, and the patient was discharged on the eighth day. There has been no recurrence of the growth.

The tumor measured an inch and a half in its longest diameter, somewhat over an inch in breadth, and was lobulated and of irregular thickness. It was enclosed in a tough capsule. After hardening, it was split open in its long axis, and showed the glandular structure somewhat compressed by hypertrophied trabeculae. A microscopical examination showed marked hypertrophy both of the glandular elements and the connective-tissue framework. Scattered all through the tumor, within the acini and between the fibres of the connective-tissue trabeculae were very numerous round cells, and a few fusiform cells. The vascularity of the gland was much increased, particularly in the fibrous envelope of the gland. A careful comparison of the various microscopic sections, cut from different parts of the tumor, showed it to be a good example of adeno-sarcoma, with marked tendency to hypertrophy of the connective-tissue elements of the gland.

## FIBRO-SARCOMA OF LACHRYMAL GLAND.

CASE III.—In December, 1887, a young lad, aged fourteen, was brought to me by his mother, with the statement that for the past five months she had noticed a tumor of the upper lid of the left eye of the boy, which had grown so as to excite her alarm. The patient was a pale, badly-nourished, under-sized lad, who had never been strong, and had often suffered from glandular enlargements. An examination showed a tumor at the upper and outer angle of the left orbit, which not only pushed the lid downwards and forwards, but had produced partial eversion of the lid, and presented somewhat below the everted margin of the lid. There was a very slight displacement of the eyeball inwards, and when he looked towards the left, there was homonymous diplopia. On pulling the lid outwards and everting it completely, the tumor appeared as a hard, resistant, somewhat lobulated mass of a bright red colour, freely movable under the lid and over the eye, but firmly attached to the bone of the orbit. It extended some little distance into the orbit and was slightly sensitive to the touch. The vision of this eye was normal. In the right eye on the temporal side, and encroaching on the margin of the cornea, was a small dermoid tumor, as large as a large pea and covered by fine hairs. In view of the youth of the patient, the growth on the left side was assumed to be rather benign than malignant, and as he had frequently suffered from enlarged and suppurating glands. A diagnosis was made of hypertrophy of the lachrymal gland. The mother was advised that the tumor be removed, before any further increase in size should cause damage to the eye, and she consented to have this done. An incision was made through the outer half of the upper lid, just beneath the superior orbital margin and opening directly into the orbit. It was found that the eversion of the lid had been mainly caused by the sagging down of the accessory gland in the lid, which was very much enlarged. The main tumor was found thickly incapsulated and adherent by a broad base to the periosteum of the frontal bone. It was grasped with a tenaculum and was dissected out intact with very little difficulty except at its base, where the adhesions to the bone were very firm. The palpebral portion of the gland was then removed through the same opening. There was rather profuse haemorrhage which lasted for some time, and delayed the final steps of the operation. An examination of the orbit showed no further growth and no infiltration of the orbital tissue, and the cavity was irrigated with a

warm bi-chloride solution and closed by deep sutures, going entirely through the tarso-orbital fascia. The case did very well, though there was considerable swelling of the parts for three days, but there was no suppuration and but very slight rise in temperature.

The tumor, exclusive of the palpebral portion, was about the shape and size of a large almond, but irregularly lobulated. It was hardened and numerous microscopic sections cut from it, which were then carefully studied. The growth, instead of being a simple hypertrophy of the gland, proved to be an unmistakable fibro-sarcoma, with marked infiltration of the glandular structure with small round cells, and numerous fusiform cells between the hypertrophied connective tissue fibres of the trabeculæ, and in the markedly thickened capsule.

This patient subsequently developed a suspicious tumor in the neck, which grew very rapidly, and he died two years later of exhaustion and anaemia.

#### MYXO-SARCOMA OF THE SPHENOID, ETHMOID, AND ORBIT.

CASE IV.—In December, 1887, I first saw a lady, aged fifty-six, who gave the following history: For about a year she had suffered from a dull pain in the right side of the nose near the glabella, and in the right orbit, which at first was intermittent, but for some months had been constant, and of late quite severe. There had been no interference with the functions of the right eye until three months ago, when she began to see double and the eye began to protrude. About the same time there appeared a rather profuse discharge from the right nostril, which still continues and seems to be purulent in character. The vision of the right eye had recently become somewhat impaired. On examination the eye was found to protrude forwards and outwards, and was limited in motility inwards and upwards. There was a moderate amount of deep subconjunctival injection and some chemosis. The iris was normal in appearance and reaction, the media were clear, and the fundus was normal. Vision in this eye was 20/40, and in the left eye was normal. When the patient looked to the left there was crossed diplopia, the image of the right eye being somewhat lower than that of the left eye. The right nostril was nearly occluded by what seemed to be thickened mucous membrane and crowding down of the inferior turbinated bone, and the same thing was observed in the rhinoscopic examination. On the left floor of the right orbit near the inner wall, and encroaching on

the inferior orbital margin, there was a hard, flattened growth, which was smooth and non-sensitive. By the crude methods of transillumination then in use, there was no reflex from the anterior wall of the maxillary antrum. A diagnosis was made of tumor of the antrum, which had perforated the roof of the antrum and entered the orbit. The grave nature of the lesion was at once recognised and also the probable extension of the disease to other neighbouring cavities, and it was deemed impossible to attempt any operation for its removal, without a preliminary enucleation of the eyeball. To this the patient consented, and it was decided to operate at once. Under profound anaesthesia the right eye was removed in the usual manner, and after the haemorrhage had ceased, a careful examination was made of the orbit. The tumor in the orbit was found to extend backwards nearly to the apex, and was directly continuous with a mass which entirely filled the maxillary antrum. The floor of the orbit was absent for about three quarters of its antero-posterior diameter, the inferior orbital margin being practically intact. The growth was carefully removed from the orbit and then from the maxillary antrum. The latter cavity was then thoroughly washed out, and an examination of its interior revealed that the growth had extended through the orifice leading from the antrum into the middle nasal meatus. The contents of the orbit were next entirely removed down to the periosteum, and it was then seen that the tumor involved both the sphenoidal fissure and the ethmoid cells as part of the os planum of the ethmoid was absent, and the growth was seen to fill the ethmoid cells. The condition of the patient was found to be much more serious than had been at first supposed, and it became incumbent upon me to complete the operation as soon as possible. The remains of the os planum were at once taken out, and the entire contents of the ethmoid cavity were removed. The lachrymal bone was cut away, and the growth removed from the nasal meatus, and also the middle and inferior turbinated bones. A large communication was thus made from the ethmoid down to the inferior meatus of the nose, and free irrigation brought away numerous small pieces of the tumor. Another careful examination revealed the hopelessness of the case, for the growth undoubtedly involved the sphenoidal antrum as well as the sphenoid and palate bones. A drainage tube was introduced into the ethmoid cells and brought out through the nostril. The orbit was loosely packed with iodoform gauze and cold antiseptic dressings applied. The patient rallied well from the operation, and on the fourth day

the drainage tube was removed, as free irrigation was easily maintained. She did very well for a month, her temperature having fallen on the fourth day, and there was no further rise. At the end of a month she was discharged from constant observation. There was at this time a healthy looking orbit and maxillary antrum, and no demonstrable return of the growth in the ethmoid cavity, and there was no discharge from the nose. She still complained, however, of deep-seated headache, and two months after the operation the tumor reappeared in the orbit, coming from the sphenoidal fissure. Somewhat later the ethmoid cavity began to fill up. I declined all further operative interference and told the patient's family of the inevitable termination of the case. She died about ten months later, apparently of exhaustion. At that time the growth had filled the orbit and protruded upon the cheek. It had extended into both nostrils and pharynx, and had refilled the right maxillary antrum. It had not extended into the left orbit, and vision in the left eye remained good up to the end.

The tumor had undoubtedly originated in the sphenoid antrum and had hence extended to the adjacent cavities and bones of the face. No autopsy was held, but there is no doubt that the disease would have been found in the frontal sinus. The tendency of most of these tumors is to extend from within outwards, which is probably the explanation why an extension to the cavity of the skull is comparatively rare, and when it does occur, why it is one of the last directions in which the disease tends to extend.

The tumor proved on microscopic examination to be a myxo-sarcoma, with numerous small, round cells, some few large, nucleated cells, with very little connective tissue, but with the cells embedded in an almost homogeneous, finely fibrillated tissue.

#### MALIGNANT TUMOR OF THE ANTERIOR CEREBRAL FOSSA AND ORBIT.

CASE V.—Early in February, 1888, I was asked to see in consultation a woman, aged forty-three, who gave the following history: For about eight months she had complained of constant frontal headache, mainly confined to the right side of the forehead, but occasionally extending to the left side. These headaches were very severe for some months, but of late they had become much less so, and had been succeeded by a constant dull ache in the right orbit. About three months before I saw her, she began to complain of diplopia and vertigo, and the latter symptom had been considered by her family physician as due to the double vision. The right eye soon began to protrude, the displacement being downwards



and outwards as well as forwards. The vision failed rather rapidly, and the sight of the left eye also became somewhat affected. When I saw her, the exophthalmos was very marked, in the direction downward, outwards, and forwards, and the motility inwards and upwards, very limited. The media were clear, but the optic nerve was of a dirty white colour, with small arteries, but the disc clearly defined. Vision in the right eye was reduced to perception of light. In the left eye there was a very slight reduction in the calibre of the arteries, but the disc was nearly normal in colour and appearance, and vision was 20/50.

A very careful examination of the right orbit did not reveal the positive presence of a tumor, though I thought that I detected a slight swelling on the roof of the orbit, near its junction with the inner wall.

The patient was an old syphilitic, and in view of the severe frontal headaches which had marked the onset of the disease, it was inferred that she had a severe, extensive periostitis of the frontal bone, and perhaps of other bones of the orbit, which had ended in the development of a diffuse gumatous infiltration, or perhaps even of a hyperostosis. With this diagnosis in view, she was put upon very large doses of potassium iodide, which was pushed rapidly to toleration, combined with moderate doses of mercuric bichloride. She bore the treatment very well, but the symptoms continued to increase, and after two months, there being no improvement, and the vision of the left eye having diminished to 20-100, the treatment was discontinued. During all this time strychnia had been administered, in the hope of arresting the degeneration of the optic nerves. The vertigo and staggering in the gait had disappeared before I saw her, which rather confirmed the diagnosis of her physician, that they were due to the diplopia, for as the vision of the right eye became abolished the double vision and vertigo ceased.

At the end of the second month the exophthalmos had increased, and a tumor could be made out above and on the inner side of the orbit, and I decided to attempt its removal. The eyeball was enucleated in the usual manner, and the presence of a tumor was at once manifest, apparently attached to the roof and inner wall of the orbit. A more careful examination, however, showed a large, irregular hole, opening directly into the anterior fossa of the skull, and through this the tumor protruded into the orbit. The hole in the roof measured roughly about an inch in all directions. Very careful manipulation with the finger and probe showed that the growth was firmly attached to the dura mater, and extended

into the anterior fossa in all directions. The location of the tumor explained the severe headache, and the lessening in the severity of these headaches was probably due to the perforation of the roof of the orbit, and the extension of the tumor into the orbital cavity, which diminished the pressure on the brain. The growth probably extended far backwards in the cerebral fossa, and must have pressed upon the right optic nerve and even the optic commissure, as both nerves were affected. Unfortunately, no examination of the fields of vision had been made by any one, previous to the loss of vision in the right eye. If this had been done, something might have been learned from the fields and their limitations, which would have assisted in the diagnosis.

The nature of the lesion of course prevented any further operative interference, and the case was treated as one of simple enucleation. I was enabled to see the patient for a month after the operation, and the tumor increased slowly in size during that period. She then left the city and I have heard nothing of her since.

#### SARCOMA OF DURA MATER AND ORBIT.

CASE VI.—In January, 1889, a lady, aged thirty-two, called on me with her husband, and gave the following history: For more than two years she had been conscious of a dull ache and discomfort in the right orbit, with occasional headache. For several months she had noticed a steady failure of vision in the right eye, and recently the same thing in the left eye. There was also some protrusion of the right eye. The headache had never been constant, but of late had increased in frequency and severity, and the pain in the orbit was also more severe. There had been no other head symptom,

An examination of the eyes showed the following existing conditions: Moderate exophthalmos on the right side, the protrusion being directly forwards. No loss of motility in any direction. Iris and pupil normal. Media clear and fundus perfectly healthy. Refraction hypermetropic. The right eye could be pushed back in place without causing any pain, but when the pressure was relieved, the exophthalmos returned. The left eye was normal in every respect. An examination of the field of vision of the right eye showed a marked limitation downwards and outwards. The urine was normal, and, with the exception of the headache and the limitation of the field, there were no symptoms suggestive of cerebral disease, and as both these symptoms might be caused by a growth

at the apex of the orbit, a provisional diagnosis was made of orbital tumor. The vision was 20-200 in the right eye, and 20/50 in the left eye. There was no disturbance of the colour-sense. I advised waiting for further developments.

The symptoms increased slowly, and it was not until nearly a year had elapsed that the exophthalmos had reached such a degree as to point unmistakably to the presence of an orbital tumor. The headache had changed but little, and the vision of the right eye was slightly worse, while that of the left eye remained unchanged. No growth was visible, or even tangible, in the orbit, and it was probable that its location was at the extreme apex of the orbit and on the nasal side. The patient was told that an attempt should be made to remove the tumor, and that it would be necessary to sacrifice the eye in the operation, and to this she consented.

Under ether anaesthesia, the right eye was enucleated in the usual way, and an examination then showed that the entire apex of the orbit was filled by a growth which seemed firmly united to the periosteum. The contents of the orbit were entirely removed down to the periosteum and carefully examined. The growth surrounded the optic nerve, and the muscles and nerves were all involved in the neoplasm. After the cavity of the orbit had been washed out the growth could be seen protruding from the optic foramen and the sphenoidal fissure. The orbit was then closely packed with iodoform gauze and a bandage applied. The patient rallied promptly from the ether and effects of the operation, and was up and about within a week. The pain in the orbit ceased at once and the headache became less severe for nearly two months. It then returned with its former severity, and at times the patient became delirious. She succumbed to an attack of pneumonia five months after the operation, but the growth had already reappeared at the apex of the orbit. No autopsy was allowed.

The tumor had probably originated in the dura mater on the right side, somewhere in the vicinity of the sella turcica, and may have spread backward into the middle fossa, as well as forward through the optic foramen and sphenoidal fissure. If there had been any positive evidence of an intracranial growth, I should have declined to operate, as the case would then have been classed as among the inoperable tumors. The orbital part of the growth was sarcomatous in character. Sections showed that the orbital cellular tissue, the muscles and the sheath of the optic nerve were all infiltrated with masses of small, round cells, with groups of fusiform cells scattered between them.

## CYSTOID ANGIOMA OF THE ORBIT.

CASE VII.—In the autumn of 1890 a gentleman, aged twenty-two, called on me, complaining of exophthalmos and a pulsation in the orbit back of the eye, and gave the following history: When a boy of ten years of age, he had received a wound of the right orbit from a sharp twig, the end of which had torn the conjunctiva near the external canthus and entered the orbit, and it was removed by a physician on the same day. There was a great amount of reaction, the lids being very much swollen, and ever since the right eye had turned in towards the nose. The vision of the eye was somewhat impaired, but subsequently improved, and he had no farther trouble with it until about two years before I saw him. He had always been conscious of a stiffness in its motions, and at times he felt a pulsation in it, but at this date the feeling of pulsation became continuous, and soon after the eye began to protrude.

On examination, I found the right eye situated on a lower plane than the left eye, and the exophthalmos was forwards and outwards. The motility outwards was somewhat impeded. The upper lid was swollen and thickened, hung down over the cornea, and pulsated. When viewed in profile the whole eye was seen to pulsate, and this motion was communicated to the fingers when placed upon it. At the upper and outer angle of the orbit could be felt a ridge of bone running backwards into the orbit. The media were clear, the iris and pupil were normal, the fundus had a grayish hue, and the retinal vessels were all engorged and pulsated strongly. Vision of the right eye was 20/30. The left eye was normal in every particular. The subconjunctival vessels were much engorged. On pressing the eye backwards, a distinct elastic mass was felt behind it. No growth could be felt in the orbit on either side, above or below. A diagnosis was made of vascular tumor of the orbit, of unknown nature, but presumably of traumatic origin. Pressure on the carotid in the neck produced no effect on the pulsation or the exophthalmos. As there had been no cerebral symptoms at the time of the injury and the case proved to be one merely of orbital injury, the probability was that the orbital walls had not been fractured, and that the injury was confined to the vessels of the orbit. The exact nature of the tumor it was impossible to determine.

An incision was made in the ocular conjunctiva on the temporal side, and a small trocar was introduced and passed down towards

the apex of the orbit. It met some resistance, which suddenly gave way, and this was followed by a small gush of thick, dark-brown, almost black, blood. The exophthalmos receded somewhat, but not entirely, and after a few seconds the flow of blood stopped. The result of the puncture and the after conditions seemed to contra-indicate the presence of any aneurysmal tumor, and to favour the view that the lesion was cystoid in character. In less than a week the exophthalmos was as great as before the puncture, and the pulsation was as marked, if not even more so. The location of the tumor at the apex of the orbit, and its vascular character, would have prevented any attempts at its removal unless preceded by enucleation of the eye, and this I was extremely reluctant to do on account of the very good existing vision. I therefore decided to first try what could be done by electrolysis, recalling the report of a very successful case by Dr. Thompson, of Indianapolis.<sup>1</sup>

Under cocaine anaesthesia the wound in the conjunctiva was reopened and the negative pole, consisting of a long steel needle, was introduced to the bottom of the orbit through the tumor. The positive pole—a moist sponge—was then placed over the temple, and the current was passed in this way indirectly through the tumor for six minutes. The strength of this current was about six milliamperes, and caused severe pain. Some little reaction followed, which was readily controlled by cold dressings. One week later, there being no reduction in the exophthalmos, a second attempt was made, and on this occasion both poles were passed into the tumor: one on each side of the eyeball. The same strength of current was employed, for about the same length of time. This was followed by a decided lessening of the pulsation, and some reduction of the exophthalmos. Four additional applications of the electric current were made at intervals of one week, making six in all.

The result, while partially successful, was not entirely so, for while both the pulsation and the exophthalmos were materially lessened, the case was not cured. One unsatisfactory feature of these applications was an increased loss of motility, both outwards and inwards, of the eye. After the last application of electrolysis, the case remained unchanged for nearly two months. The pulsation then began to increase again, and the eye became more prominent.

It seemed useless to resort to this method of treatment again,

<sup>1</sup> Archives of Ophthalmology, XII, 1, 1883.



and, as the vision of the right eye had materially failed, I decided to enucleate the eyeball and attempt the removal of the tumor "en masse." The patient was etherized and the eye was enucleated in the usual manner. Very firm adhesions were found between the tumor and the eyeball posteriorly, and in separating them more or less blood was lost. The optic nerve was divided close to the globe without any difficulty, and the latter was then removed. After washing out the orbit, the apex of the cavity was seen to be filled up by a dark mass which had no visible pulsation, but on pressing upon it with the finger a distinct pulsation could be felt. The contents of the orbit were then carefully dissected out, and as the apex of the orbit was reached, several vessels of considerable size were met and ligated, one of them being probably the ophthalmic artery. There was comparatively little blood lost, though after the tumor was removed there was considerable oozing, which was finally controlled by iced applications and pressure. The orbit was then thoroughly washed out with bichloride solution (1-1000), and was then packed tightly with iodoform gauze, and a pressure bandage was applied over the closed lids. There was almost no reaction, and on the second day the packing was removed, the orbit again washed out, and the packing and bandage reapplied for two days longer. The packing was then removed and cold dressings applied. The patient was discharged on the twelfth day, and he has no return of any trouble since.

An examination of the tumor showed some interesting features. It was found to occupy mainly the pyramidal space or funnel between the ocular muscles, but it extended outside the muscular barrier and involved the fatty tissue at the rear of the orbit, and extended forwards upon the eyeball. It surrounded the optic nerve, which was compressed by the growth. The unusually dark colour of the tumor gave the impression of a melano-sarcoma, which was dissipated after it had been opened by a longitudinal incision. It was surrounded by a tough, thick capsule of very dense connective tissue, which under the microscope contained quantities of brown pigment, some in fusiform cells and some as free granules. In the centre were numerous vacuoles containing a thick, dark-brown grumous fluid. These vascular spaces were separated by trabeculae, or partitions of connective tissue, which also contained pigment. Here and there on the walls of the lacunae were small patches of epithelium which were deeply stained. The points where the needle had entered in the operation of electrolysis were distinguished by the partial destruction

of the connective-tissue envelope, and the obliteration of the neighbouring vacuoles. The optic nerve ran through the centre of the tumor, and cross sections of the nerve showed atrophy of the nerve fibres, but no thrombus of the central retinal artery. Like all tumors of this nature, its progress had been very slow, but the only point in which it differed from similar cases was in the presence of a distinct pulsation, which was not only felt by the patient but observed by the surgeon. Portions of the tumor were so solidified that I could not but think that had the electrolysis been persisted in, a cure would have been effected, and the patient would have been spared the more serious operation and the loss of the eye.

Since the above was written, the report of a very interesting case of cystoid angioma of the orbit has appeared in the "*Annales d' Oculistique*," for September, 1895, from the pen of E. Valude, in which two applications of electrolysis proved successful in causing a disappearance of all the symptoms.

## NOTES ON THE DIAGNOSIS OF INTERSTITIAL CEREBRITIS.

By NEIL J. HEPBURN, M. D., of New York County.

*October 15, 1895.*

It may be of interest to relate the history and progress of two cases which have within a few years come under my observation, and to make some attempts at deduction from their consideration and comparison.

The first was that of a physician practising in this city. He was first seen in 1891, when he was fitted with glasses. At that time his symptoms were merely a difficulty in seeing at times when tired, and a slight amount of sensitiveness to light, which were considered to be accounted for by his error of refraction. There was apparently no defect in the ocular muscles, pupils regular and normally sensitive to light and accommodation, and a healthy fundus oculi, except that the optic nerve entrance was creamy white, not muddy looking, but perhaps rather more pink than the typical disc is said to be. Colour perception good, that for red being markedly so. The field as taken by the perimeter showed a slight shrinkage on the temporal side, but this was so little as to be of doubtful significance.

In the spring of 1892, he was again found to be complaining that he had a vague sense of discomfort in or about his eyes, and that even with his glasses he was not always comfortable. On re-examination his correction was found to be the same, but the amount of vision had deteriorated to  $\frac{20}{20}$ ; there was also occasional sluggishness of the right pupil. Examination by the ophthalmoscope showed nothing especially marked, except that the optic discs were less creamy and more white, and the perimeter disclosed a positive cut-

ting off of the field on the temporal side to the extent of about  $10^{\circ}$ , the field extending in that direction to about  $80^{\circ}$ . Colour perception unchanged. He was advised to give up business for a while and to take a complete rest, and a relative who could be depended on, was informed of the suspicion of approaching mental unsoundness. A slight general tremour was now noticeable at times.

He was seen again during the summer and in the autumn another careful examination was made. The ophthalmoscope now disclosed an optic disc beginning to show atrophy, the vessels, however, being of about normal calibre and appearance, but looking as if they were ever so slightly elevated above the nerve tissue beneath. The right pupil was periodically dilated, and there was sometimes a weakness of the right internal rectus muscle. There was also occasional muscular tremour of the face, with slight flattening of the nasolabial fold, more on the left. Tongue protruded well, but slightly tremulous at the tip. I omitted to say that the field of vision was still more contracted, and that the vision was  $\frac{3}{8}$ —with correction. He was beginning to become impatient in his manner, and even his speech was by jerks at times and with occasional repetitions.

The mental unsoundness and occasional paroxysms which accompanied it became such that he was placed by his friends in an institution where he later died, without having at any time shown any special remission of the disease.

The other case which I wish to relate was first seen early in the year 1892, when he complained that the glasses he then wore were uncomfortable. On examination by the ophthalmoscope the fundus and media were found apparently normal. The eyes slightly hypermetropic, and with the proper correction, vision and field were normal. There was an esophoria of  $2^{\circ}$ . Colour perception was exceptionally good, and he was a successful artist in oil and water colour. He was given the proper correction and all went well for a year.

He returned, complaining of a little obscure discomfort in

and about the eyes. This time he was seen at the Manhattan Eye and Ear Hospital, and careful observations made and notes preserved. His vision was found to be  $\frac{3}{80}$ —with correction. By the ophthalmoscope the media and fundus oculi clear, vessels normal in size and distribution, and optic discs of a creamy, slightly pinkish hue, which was variously considered rather odd or normal by several observers. The field, however, was cut off temporally in each eye  $10^\circ$ . The patient was very intelligent and well informed, but the facies, a slight tremour, and a hesitating repetition occasionally at the end of a sentence were looked upon by neurologists who saw him at that time, as suspiciously like those of general paresis.

The case was kept under observation for several months, making weekly visits without other treatment than a placebo, and the changes in the optic nerve watched with much interest. The disc gradually lost its rosy tint, and became pale, till it was considered by those who observed it to be a case of commencing optic nerve atrophy, the field measured by the perimeter becoming slightly more contracted. At this time, also, the retina in one or two spots in the immediate neighbourhood of the nerve entrance, and to the temporal side, began to look more intensely reddened and as if teased up with a needle point. These spots were longitudinal and in concentric lines with the edge of the disc. They gradually deepened in colour, but at no time appeared to be either elevated or depressed.

In the meantime the nasolabial fold became slightly less prominent, the tremour began to be noticeable, and the repetition at the end of a sentence became more marked and constant, and it appeared as if the patient was drifting into a case of general paresis. He became impatient and it was decided to put him on a course of what was deemed appropriate treatment, as it appeared as if the affection in the eye apparatus, at least, was of the interstitial type of a low grade, and it was considered possible that it might at least be arrested by measures directed to the control of that condition.

The improvement after three weeks began to be noticeable,



in the general condition as well as in the appearances in the eyes, and in about six months from the beginning of treatment, the appearances in the retina had disappeared, leaving no trace; the optic nerve was of a fairly healthy colour, the vision was perfect, the field perfect, and he was anxious to return to his usual avocation. The facial lines had become clearly defined, the lingual tremour was gone, the speech was clear and deliberate, and the whole appearance of the patient was one of robust health, corroborating his assertion that he could eat, sleep, or work as well as he ever had, and better than he had been for years.  $V=2\frac{9}{10}+$ .

He still remains under observation, a relative having been warned of the possible danger of a relapse, but this danger I consider to be now diminishing, inasmuch as nearly a year and a half has elapsed since he has had any treatment.

The peculiar interest attaching to this latter case, arises from the prompt response to treatment not only of the eye symptoms, but also of those symptoms which appear to point to the incurable malady called general paresis, and the increase and subsidence of the one in a direct ratio to that of the other. This certainly looks as if both were dependent upon the same original cause, at least to a large extent, and the favourable result would at least warrant another attempt in the same direction. The connection between the appearances of the optic nerve when symmetrical, and affections of the frontal brain, would seem clear.

It may be stated here that no history of syphilis could be elicited from either of the patients, and no sign of a primary sore or other remains of syphilitic infection could be observed, although on account of the view taken by many that syphilis is the predisposing factor in the great majority of these cases, a careful investigation was made. Neither was there hepatic, cardiac, or renal disease, repeated examinations of the urine having failed to show pathological results, with perhaps a slight increase in the amount of urea.

The first case was a cigarette smoker, and very moderate drinker; the second neither, which would appear to go to

corroborate the assertion of some observers that alcohol and tobacco are not prominent causes of the development of this affection. Both were busy men and not prone to venereal excesses, so that their affliction was certainly not produced by that combination of wine, women, and worry, upon which so much stress is laid as the prime cause of mental disorder.

According to pathological anatomy the term general paresis refers to a symptom rather than a disease. The lesions found post-mortem have been at different times variously interpreted and there has been much discussion over the appearances found in the brain on microscopic examination. Dr. Henry J. Berkeley, in the "Johns Hopkins Hospital Reports," Vol. IV, Nos. 4 and 5, 1894, gave a quasi endorsement to the vasomotor theory of Schüle, which would indicate that the nerve degeneration was the first step in the process, and infers that the process is a non-inflammatory one. He states that he finds "alterations of the blood vessels sheaths, probably occasioning local hyperæmic states and dilations most noticeable in the smaller vessels, changes in the perivascular flow from the widening of the channels, thickening of the lymph sheaths, and later filling up of the peri-vascular spaces with round-cell proliferation, consequent mal-nutrition of the nerve elements, granulo-fatty degeneration of the cells, with rare myeline changes, alterations of the nuclei, secondary atrophy of the cell structure and consequent degradation of those medullated fibres that have their origin in the cells. Accompanying or following this, a sub-inflammatory condition of the connective tissue elements is set up." He concludes, "For practical purposes we have a diffuse pre-senile atrophy of the whole brain, occurring with far greater virulence than the atrophy of old age, and originating in a primary alteration of the sheaths of the vascular channels."

In the *American Journal of Insanity*, January, 1895, Dr. Berkeley reports a case of paresis, the first symptoms of which were noted in September, 1893. He was admitted

to the city insane asylum, April, 1894, and died June 17, 1894. Autopsy twelve hours after death. The long description of the macroscopic and microscopic appearances we will omit, but he concludes that "No evidence of inflammation, in the accepted sense of the term, is anywhere to be discovered in the cerebral tissues to favor a theory of a diffuse encephalitis being the primary factor in the pathology of the affection. On the other hand, all the evidences that are given are in favour of a simple degeneration of the nerve elements." He concludes by dividing the ordinary stages of the malady into,—

1. A period in which the nerve structures begin to receive an insufficient supply of nutrient material from the blood, and in which the more active and recently acquired mental functions begin to fail, to which is added a certain degree of irritability, both muscular and mental.

2. A period in which the loss of nutrient material has become so pronounced that the starving tissues begin to feed upon themselves, disturbed cellular metabolism results, which is clinically shown in increased motor excitement and grandiose ideas.

3. A period in which the nutrient supply is so diminished and nerve tissue changes have become so far advanced, that there is actual disintegration of the nerve cell, and beginning overgrowth of the support substance, the stage of terminal dementia and pronounced muscular paresis.

The above is perhaps a fair statement of the position of those who believe that the disease is a primary atrophy and originates in the nerve tissue itself. In the eyes observed the changes did not, however, appear to follow in the order stated, or perhaps it might be more proper to say that the appearance was of fine infiltration of plastic material into the nerve head, accompanied by no apparent change in the vessels themselves or in their lymph sheaths. The vessels showed no thickening or peri-vascular exudation, and were not tortuous. The changes in the nerve fibres appeared to be secondary to this pinkish infiltration and to be the direct

result. The loss of function in the retina was central as well as peripheral, although more marked at the edge of the field, and bore a close relation to the appearance of the disc.

If the changes which take place in the optic nerve entrance correspond to those which occur in the brain in this affection, it is manifest that much earlier observations can be made with the ophthalmoscope than by any other method.

I have used the term *interstitial cerebritis* to denote a pathological entity, rather than to denote an absolutely inflammatory condition because the condition is certainly one of interstitial change (if not of exudation), and a positive lesion; whereas the terms now in ordinary use, *general paresis*, or *general paralysis of the insane*, express only a symptom, and a symptom which is more or less common to other affections of the brain and nerve centres.

Naturally in view of their anatomical location, it would *a priori* appear reasonable that a general affection of the frontal lobes might make itself apparent through analogous conditions seen in the nerve head. It does not seem impossible, for instance, that a condition analogous to *interstitial neuritis* may take place in the frontal cortex, or that so occurring, it may show itself in the alterations in the optic disc and retina, long before it so affects the coarser muscular and nutritive processes. Indeed, the optic nerve and retina are the only fine nerve structures so situated as to be open to inspection at all times.

The changes in the optic nerve and retina in the cases above related, and in a number of others of which they are fair types, would point to the existence of a general nervous hyperplasia, which appears to affect the vessels only secondarily and at a later period in the disease, and while not an acute and rapidly progressive condition, to constitute an *interstitial inflammation*.

I am aware that pathological anatomists tell us that their researches into the brain tissue in the subjects of *general paresis*, lead them to the conclusion that the affection is a *primary atrophy*. But the cases on which it is possible to

make post-mortem examination and investigations are only those that are so far advanced that only the atropic condition is visible, the beginning of the process having been invisible and the more so that the early symptoms, from the nature of the affection, are likely to pass unnoticed.

I have ventured to use the term *interstitial cerebritis* instead of *general paresis*, believing, as I do, that it expresses more definitely a condition, which, so far, has not been positively proven not to exist, and which if it is analogous to the appearances which have been called *primary atrophy of the optic nerve*, has not been so in these cases.

The appearances which I have described in the optic nerve entrance and retina I have seen result in several cases in what was called *primary optic nerve atrophy* by writers on ophthalmology. Indeed, some of the cases have been seen later in the disease by expert ophthalmoscopists, who I know to be very accurate observers, and have been pronounced positively *primary atrophy*. Had I not been enabled to see the appearances in the beginning, I am sure I would have made the same positive assertion myself.

The stage of redness, infiltration, congestion, or inflammation, call it what you will, is short, and not highly marked, but characteristic, followed with reasonable but variable rapidity by the stage of blanching and atrophy, and it is reasonable to suppose that it would be very difficult to obtain an autopsy sufficiently early to see even the remains of exudation or fibres of connective tissue. Only the results of such cutting off of nutrition as are seen in the atropic nerve elements would be apparent.



## THE EMERGENCY TREATMENT OF DISEASES OF AND INJURIES TO THE EYE.

By JOHN E. WEEKS, M. D., of New York County.

October 15, 1895.

The words that follow are given in the hope that they may be of some value to medical men not specialists in diseases of the eye, who may see them and may meet with cases similar to those mentioned. In the cases that are kept under observation until the disease terminates or the wound heals good results may be obtained by following out the treatment advised. In other cases the patient may be placed in the best possible condition until he can have the direct advice of one who has made diseases of the eye a special study.

Under the head of acute diseases requiring emergency treatment may be placed the following:

### A.—DISEASES OF THE LIDS.

*Hordeolum, or sty ; abscess ; erysipelas.*

*Hordeolum.*—If pus is not present it is best to apply moist heat for twenty-four or forty-eight hours by means of pledgets of linen or small flaxseed poultices frequently renewed. As soon as the presence of pus can be determined it should be permitted to escape by a free puncture. All swelling will subside in a day or two, if the parts are bathed with hot water a few times each day for two or three days.

Abscess of the lids should be treated as abscess occurring in other parts of the body. It should be freely opened, the incision being made parallel to the margin of the lids, the contents thoroughly removed by means of a curette, the

walls of the abscess cavity rendered aseptic by means of a reliable germicidal solution, such as a 1-3000 solution of the bichloride of mercury, the incision closed by suture, when feasible, and the eye bandaged.

Erysipelas of the lids is usually associated with erysipelas of the face, and should be treated exactly as erysipelas occurring in other parts of the body. Erysipelas sometimes extends to the intra-orbital tissue, and may produce complete blindness. When erysipelas affects the face it should be gotten under control as quickly as possible.

#### B.—DISEASES OF THE CONJUNCTIVA.

*Muco-purulent conjunctivitis; gonorrhoeal or purulent conjunctivitis (which includes ophthalmia neonatorum); diphtheritic conjunctivitis.*

It is important to remember the fact that all acute diseases of the conjunctiva that are accompanied by a discharge are contagious. The first care of the medical attendant should be to see that all proper precautions are taken to prevent the spread of the disease. If possible the patient should be kept apart from other members of the family; certainly he should sleep alone. The wash basins, towels, and appliances used about the affected person should not be employed by others. If but one eye is affected great care must be observed to prevent infection of the fellow eye. Sealing up the unaffected eye is indicated in many cases. This may be done very well by means of Buller's shield, which consists of a watch crystal, the margins of which are held between two strips of rubber adhesive plaster. The upper encircling piece of adhesive plaster is made to project beyond the lower, so that it may adhere to the skin of the face and brow when placed in position. A small opening is left beneath the edge of the watch crystal at the outer lower border, for purposes of ventilation. This appliance protects the unaffected eye and permits of a certain degree of vision.

If an inflamed condition of the conjunctiva of recent origin is brought to the notice of the physician, in the absence of acute febrile disease, the possibility of a gonorrhoeal origin should be recognised. Inquiry as to the presence of a urethral or vaginal discharge will aid in making the diagnosis. Happily, in the majority of the cases, the conjunctivitis will be of the muco-purulent variety, commonly known as "pink eye." Whether muco-purulent or gonorrhoeal, the following treatment should be resorted to: The eye should be carefully cleansed by washing with a two or three per cent. solution of boric acid, everting the lids and permitting the solution to flow over the conjunctiva. Absorbent cotton or a pipette may be used to carry the solution to the eye. Sponges should never be used about the eyes. After cleansing the eye the surface of the palpebral conjunctiva should be freely painted with a one per cent. solution of the nitrate of silver. The washing of the eye should be repeated sufficiently often to keep the eye free from secretion; every twenty minutes in cases where the secretion is profuse, at longer intervals in other cases. It is better to wash the eye too often than not often enough. The nitrate of silver should be applied once or twice every twenty-four hours according to the severity of the case. If much swelling of the lids is present, cold applications should be made continuously until the swelling shows signs of subsiding, when the cold applications may be employed for two or three hours at a time followed by an interval of two or three hours. These applications should not interfere with the cleansing of the eye, nor with the treatment of the conjunctiva. The applications are made as follows: Thin pads of absorbent cotton about two inches in diameter or pledgets of linen, one and one half inches square and three or four layers in thickness, each to the number of twelve or fifteen, should be moistened and placed on a cake of ice, which is supported over a basin by a towel drawn over its edge. These pledgets should be transferred from ice to the eye and back again at intervals of two or three minutes, and so

continued, the soiled pledgets being thrown away and new ones substituted. If the integument of the lids shows signs of irritation it may be smeared with a ten per cent. ointment of boric acid from time to time. Should the case be severe, or one of gonorrhoeal ophthalmia, early consultation should be had. In ophthalmia neonatorum the treatment as outlined above may be followed. The shield will be found to be of little value in these cases. Careful cleansing with a saturated solution of boric acid is of the greatest value. In applying the nitrate of silver small pledgets of cotton wrapped around the end of an applicator may be used; wooden tooth-picks make excellent applicators, as after being used cotton and applicator may be thrown away.

Diphtheria of the conjunctiva is usually accompanied by nasal or pharyngeal diphtheria. Enormous swelling of the lids and a conjunctival pseudo-membrane develop early. Cold applications, as indicated above, and frequent cleansing with a solution of boric acid are required at once. A two per cent. solution of the nitrate of silver may be applied to the conjunctiva if the conjunctiva can be exposed; usually this cannot be done satisfactorily. If the swelling of the lids is sufficiently intense to produce marked pressure on the cornea the pressure should be relieved by making a free division of the outer commissure.

### C.—DISEASES OF THE LACHRYMAL APPARATUS.

*Phlegmon of the lachrymal sac.*—If redness and swelling of the tissues over the lachrymal sac, accompanied by pain on pressure and the flow of tears over the cheek, are present, we may be very sure that phlegmon of the sac is threatened. In the absence of fluctuation it is probably best to resort to the more or less constant application of moist heat to the affected part (not over the eye), after the manner described when considering the treatment of hordeolum. If fluctuation is present it is best to make a free incision into the sac, beginning 2 to 4 millimeters from the inner canthus toward the median line, cutting downward and outward for a dis-

tance of 1 to 1.5 centimeters. The contents of the sac should be thoroughly removed, the sides of the cavity gently scraped with a curette and thoroughly washed with a solution of sublimate 1 to 3000. The wound should be kept open for a few days by means of a strip of aseptic absorbent gauze and the eye bandaged. After the swelling has partly subsided the operation for the opening of the lachrymal canal may be made.

#### D.—DISEASE AFFECTING THE TISSUES OF THE ORBIT.

*Orbital cellulitis.*—This condition is usually ushered in with pain, more or less severe, referable to the eye, orbit, and side of the head. There is some febrile action. The eye soon becomes prominent (pushed forward), the ocular conjunctiva reddened and prominent, the movements of the eyeball limited, and the lids usually slightly swollen. The process may subside without the formation of pus, but this occurs only in a minority of the cases. At the onset orbital cellulitis should be treated by applications of cold (in addition to an endeavour to remove the cause of the condition), in order to limit exudation into the orbital tissue. After one or two days have passed, it is better to change to hot applications, for the purpose of hastening absorption of the exudate. When pus is present free openings should be made into the orbital tissue at points where the pus is nearest the surface; all cavities should be freely opened and thoroughly douched with a solution of sublimate 1 to 3000. Drainage should be secured by means of drainage tubes or gauze. On the whole, it is well to get such a case into the hands of the ophthalmic surgeon as soon as possible.

#### E.—DISEASES OF THE EYEBALL.

*Infected corneal ulcer; iritis of whatever variety; glaucoma in the acute form.*

The diagnosis of infected corneal ulcer can be made, in almost every case, by simple inspection; it presents loss of substance with greyish infiltration of corneal tissue. Clean-



liness, obtained by bathing with a two or three per cent. solution of boric acid, four or five times daily; antisepsis obtained by dropping six or eight drops of a solution of sublimate 1 to 5000 or 1 to 8000 into the eye every one or two hours, and mydriasis, if perforation of the cornea is threatened, obtained by dropping one or two drops of a one per cent. solution of the sulphate of atropia into the eye twice daily, will suffice for the emergency treatment. Chlorine water may be substituted for the sublimate solution. In cases of small infected corneal ulcer the process can frequently be aborted by touching the affected spot thoroughly with the thermo cautery, or with pure carbolic acid, applied carefully to the affected spot only.

*Iritis.*—If a patient presents a condition of inflammation of the eye, unaccompanied with a puriform discharge and with an intact cornea, intraocular disease may be suspected. The two intraocular diseases most likely to produce redness of the ocular conjunctiva, and other symptoms of inflammation, are iritis and glaucoma. A differential diagnosis must be made, as treatment in case of a wrong diagnosis is often accompanied by most calamitous results. The following comparison of symptoms, when no treatment has been previously given, will be of value in deciding the character of the disease:

## IRITIS.

1. Tension usually not above the normal, never much increased, often sub-normal.

2. Deep rosy pericorneal injection of ocular conjunctiva most marked at the margin of the cornea. Injection arterial in nature.

3. Cornea fairly clear, transparent.

4. Anterior chamber of normal depth, aqueous, hazy.

5. Iris congested, muddy. Pupil small, dilates slowly and often irregularly, because of posterior synechiae.

## GLAUCOMA.

1. Tension always above the normal, sometimes as hard as wood.

2. Deep red injection of ocular conjunctiva, venous in nature. Marked dilatation of larger veins.

3. Cornea hazy, may have a decidedly steamy appearance.

4. Anterior chamber shallow; aqueous transparent except in rare haemorrhagic forms.

5. Iris usually slightly darker than in fellow eye, not congested. Pupil dilated, oval, long axis nearly vertical, reacts but very slightly to stimulus of light.

6. Media hazy, due to exudation into aqueous and vitreous chambers.

7. Vision diminished. Field normal in extent.

8. Pain in temple and side of head corresponding with affected eye, worse at night, quite intense.

6. Media hazy, due to cloudiness of cornea and vitreous.

7. Vision diminished. Field limited, particularly to nasal side and above.

8. Pain in head not confined to side of affected eye, pain in eye often very intense, not worse at night.

#### EMERGENCY TREATMENT.—LOCAL.

1. Bathing with water as warm as can be tolerated, continued for one half hour each time, repeated every hour or two.

2. Atropine, one per cent. solution, dropped into the eye every one to three hours.

3. Leeches to the temple if the pain is severe.

4. No operative procedure.

1. Light pressure bandage.

2. Eserine, or pilocarpine, one per cent. solution, distilled into the eye thrice daily. Atropine will increase the severity of the disease.

3. Leeches are of no avail.

4. Iridectomy, if eserine or pilocarpine do not reduce the tension.

#### GENERAL TREATMENT.

Directed against the constitutional condition that stands in a causative relation to the disease.

Laxatives, usually salines. The salicylate of soda should be given if there is any evidence of a rheumatic or gouty diathesis.

Consultation should be had in either of these conditions at an early day.

#### INJURIES, FOREIGN BODIES, BURNS, STINGS FROM INSECTS.

Contusions of the lids should be treated by applications of cold for the first six or eight hours at least, the cold may be applied for twenty-four hours to advantage; it acts as a haemostatic, and is of little or no value when the tendency to the escape of the fluid constituents of the blood from the blood vessels, has ceased. The applications can be made by the use of iced cloths; however, a thin compress bandage, over which a light ice-bag is placed, keeping the patient quiet for a few hours, is probably the very best treatment to prevent oedema and extravasation of blood, and subsequent discolouration of the tissue. After twenty-four hours have

elapsed, absorption of exuded serum or blood will be hastened by hot bathing.

Lacerated wounds of the lids are treated by washing thoroughly with an antiseptic solution, such as sublimate 1 to 3000, and bringing the margins of the wounds together in perfect apposition with silk sutures. Small wounds may be dressed with collodion,—large wounds require an aseptic bandage.

Burns and scalds produce an effect on skin, conjunctiva, and cornea so similar that they may be considered in the same paragraph. Burns with hot iron, molten lead, steam, or hot water, should be treated at once by washing with a weak antiseptic, as a three per cent. solution of boric acid, and should then be covered with a protective. A bland ointment, as an ointment of boric acid, five per cent. in vaseline, or sterilised olive oil, or carron oil with a covering of rubber tissue, will produce good results. In the treatment of burns with nitric acid, which turns the tissues yellow, with sulphuric acid which turns the tissues red, or with any acid, the acid should first be thoroughly neutralised. This may be accomplished by covering the surface with a paste of the bi-carbonate of soda, or by thoroughly washing with a weak solution of the carbonate of soda or ammonia. After neutralising the acid, a bland ointment, or some olive oil, should be applied. Burns from lime, or from any alkali, call for immediate treatment, as the destruction of tissue, particularly of the conjunctiva and cornea, is much greater after burns from these substances than from any other cause. Deep, destructive processes, with subsequent opacification of tissue, result. In the treatment of burns, from the caustic alkalies, the solid particles should be removed with cotton or forceps, and the eye then washed thoroughly with something that will neutralise the action of the caustic. Milk is preferable to water for this purpose. In burns produced by lime, Fuchs advises washing the conjunctiva with oil, and afterwards dropping into the conjunctival sac, a concentrated solution of sugar. Cane sugar forms an insoluble

compound with lime. The affected surface may also be washed with a weak solution of acetic acid, or with a very little vinegar and water, after which it should be thoroughly douched with warm water, and some olive oil or vaseline introduced. The above applies to whatever part is affected.

Foreign bodies of the lids are treated by removal, thorough cleansing of the wound with an antiseptic solution, such as a solution of sublimate, 1 to 2000, and eventually closing the wound, if it be of sufficient size, with silk sutures.

*Foreign bodies of the conjunctiva.*—These will usually be found lodged in the marginal groove of the upper lid, a portion of the tarsal conjunctiva situated immediately back of the inner angle of the margin of the lid. Often the foreign body is found located higher up on the tarsal conjunctiva of the upper lid. It is seldom that we meet with a foreign body in the upper fornix conjunctivae; they are much more frequently in the lower cul-de-sac. Fish-scales, cilia, and other floating foreign bodies occur more frequently in the lower conjunctival sac. Particles of coal, cinders, etc., are usually found embedded in the tarsal conjunctiva of the upper lid.

*Treatment.*—After everting the lid, the foreign body can usually be dislodged by touching it with the cotton on a small cotton probang. In rare cases, the foreign body spud, or the point of a small scalpel, will be required. If much irritation has been produced, an antiseptic wash should be used subsequently.

Foreign bodies on the cornea can usually be seen by simple inspection by good light. Oblique illumination with, at times, the aid of a strong magnifying glass, is necessary in some cases.

*Treatment.*—Two or three minutes after a drop of a four per cent. or a ten per cent. solution of cocaine has been instilled, an attempt may be made to remove the foreign body. If the foreign body is superficially lodged, it can frequently be removed by brushing it with a small probang made by winding a few fibres of cotton around the end of a

wooden tooth-pick, or small applicator. Do not use the chewed end of a tooth-pick, or match, as you might infect the cornea. If one or two gentle rubs do not dislodge the foreign body, a foreign body spud or needle should be employed. Care should be observed to have the instrument aseptic. As little injury as possible should be done to the surrounding tissue. Foreign bodies that are very deeply embedded must be cut out; such a case should be referred to one skilled in the treatment of diseases of the eye.

*Foreign bodies in the interior of the eye-ball.*— If a patient suffering from such an injury presents himself, the eye should be carefully cleansed by washing with a solution of sublimate 1 to 5000 to prevent infection of the globe, if possible. If the foreign body does not present at the surface so that it can be seized with the forceps and easily removed, a compress bandage should be applied, and the patient should be placed under the care of a skilled ophthalmic surgeon at the earliest possible moment. No attempt should be made to remove the foreign body unless it presents at the wound, except by the skilled surgeon.

*Lacerated wounds of the eye-ball.*— If the wounds are not very severe, the wound and surrounding tissue may be rendered aseptic, and a compress bandage applied. If a portion of the contents of the eye has escaped, it will be well to remove the eyeball, an operation that may be done by the physician in attendance, provided he is somewhat skilled in surgery. In removing an eyeball, as much of the conjunctiva as possible should be saved, in order to permit of the formation of a sac sufficiently large to retain an artificial eye. It must be remembered that the removal of a partly collapsed eye is not so readily effected as the removal of an intact eyeball.

*Instruments required.*— Speculum, fixation forceps, small scissors curved on the flat, points not very sharp, two strabismus hooks, enucleation scissors, needles, and silk, needle holder. The instruments should be sterilised.

The operation may be performed as follows:



Ether anaesthesia. The tissues are rendered aseptic by thoroughly washing with a sublimate solution, 1 to 3000. The lids are separated with the speculum, the conjunctiva is now dissected from the sclerotic, commencing at the corneal margin. By means of a strabismus hook the tissues attached to the globe are caught up, and are divided between the hook and the sclerotic; the globe is then seized with the fixation forceps, and the nerve is severed by cutting from the nasal toward the temporal side, using the enucleation scissors for the purpose. After removing the globe, the margins of the conjunctiva are brought together by means of a single "tobacco pouch" suture, and an aseptic compress bandage applied.

*Stings and bites from insects.*—Such injuries are usually followed by more or less intense swelling of the lids and tissues in the immediate vicinity. The condition is often mistaken for erysipelas, but the swelling differs from that of erysipelas, being more translucent, the skin is less red, and there is almost complete absence of constitutional disturbance. These cases should be treated by thoroughly washing the parts with a solution of sublimate 1 to 3000, and then by applying cold. The swelling resulting from stings or bites from insects will usually subside in thirty-six to forty-eight hours.

#### BITES FROM DOGS AND OTHER ANIMALS.

Wounds of the eye-lids, or of the tissues of the orbit other than the globe, should be treated by thoroughly cleansing with a good antiseptic, and then thoroughly cauterised with a stick of nitrate of silver. If laceration of the globe occurs, enucleation is usually advisable.

## EMPHYEMA OF THE ANTRUM.

By WILLIAM CARR, M. D., of New York County.

*October 15, 1895.*

The object of this paper is not to discuss the anatomy and pathology of empyema of the antrum, but from the standpoint of the oral surgeon to dwell especially upon what is of equal interest to the general practitioner and the specialist, viz.: Its etiology and treatment, and being deeply impressed with the belief that closer examination of the oral cavity is necessary to determine whether, and to what extent, diseased teeth and roots and their alveoli are involved, and the measure of their responsibility for existing conditions.

In his treatise on "The Normal and Pathological Conditions of the Air Passages," Zuckerkandl claims that the majority of cases of empyema of the maxillary sinus directly results from the extension of the inflammatory process of the nasal mucous membrane produced by continuity of tissue: that is, that rhinitis, either chronic or acute, or any inflammatory condition of the nasal mucous membrane may produce an inflammatory condition and subsequent suppuration of the sinus. He adds, "My experiences with the inflammatory diseases of the lining of the maxillary sinus are, that they mostly follow pathological processes of the nasal mucous membrane, and according to that, the soft parts of the nasal and maxillary cavities are generally diseased together." This view is entertained by many others, among whom are Krause, Chatallier, Fletcher, and Bronner.

Fletcher states that he examined one hundred skulls for the following points:

1. For abscessed teeth.
2. For septa.

3. For conical protrusion of the roots of the teeth into the antrum.

4. For perforation by the roots of the teeth without protrusion.

5. For perforation of the antrum from ulcerated teeth.

He found evidences of ulceration in a number of the canines and bicuspid, which, with but a single exception, had no apparent connection with the antra. Ulceration of the molars was found in more than twenty-five per cent. of the cases. Altogether there were fifty-seven ulcerated teeth. "Of these fifty-seven possible cases of perforation by inflammation and its results," he found four teeth that had perforated the antrum.

Upon this examination, together with years of experience, he bases his opinion that suppuration of the sinus rarely occurs from diseased teeth, but rather is more largely caused by inter-nasal disorders, thus coinciding with Zuckerkandl and others.

Fletcher's investigations seem to have been made for negative results. Instead of proving that antral suppuration results more frequently from other causes than diseased teeth, he has merely confirmed what was already known and accepted, viz.: That alveolar abscesses form upon the teeth which sometimes find vent through the alveolus; that the sinus is frequently divided into two portions by a septum of bone, and that roots of teeth perforate the antrum. In no instance does he mention traces of suppuration due to other causes,—leaving the inference that only four antra were in any degree diseased, and these he admits were caused by diseased teeth. I consider this a large percentage from one hundred skulls taken at random, and his investigation confirms my belief that the teeth are largely responsible for antral suppuration.

Bosworth does not agree with Zuckerkandl that suppuration of the antrum is the direct result of extension of the inflammatory process by continuity of tissue, but states that few, if any, cases can be directly traced to this cause, and

claims that inflammation of the mucous membrane shows but slight tendency to extend from one region to another. As an argument to sustain this theory he says,—“But few persons suffer from antral disease compared with the great numbers who are afflicted with chronic rhinitis.” At the same time, he admits that in many cases hypertrophic rhinitis produces antral diseases, not by extension, but because this hypertrophic process, in some manner, causes occlusion of the ostium maxillare. This naturally leads to the belief that he strongly inclines to the theory that nasal polypi, hypertrophic rhinitis, or any other cause that operates to produce occlusion of the ostium maxillare will produce suppuration of the sinus.

Among those who advance the theory that diseased teeth are the most fruitful cause of antral disease may be mentioned Ingals, Frankel, Garel, Schech, Garretson, Beverly Robinson, Lennox Brown, and Watson.

Watson says,—“By far the most frequent cause appears to be the extension of suppuration from the root of a carious tooth.”

Ingals says,—“Disease of the teeth is the principal cause of the affection.”

Schech says,—“Among the causes of suppuration of the sinus from an etiological standpoint, diseased condition of the teeth of upper jaw and their alveoli stands first.”

Boerhave adopted the theory that the secretion contained in the maxillary sinus, “a bland, inodorous, gelatinous, colourless fluid,” keeps the walls moist but does not accumulate in the sinus, a part of it being absorbed and a part being evaporated by the passing air current. Should causes operate to close the ostium, so that there would neither be admission of air to nor exit of air from the sinus, the vascular system would gradually absorb the confined air, which would be replaced in the sinus by the accumulating secretion. But the secretion, being produced more rapidly than absorbed, the air yet remaining in the sinus would decompose the accumulated mucus, causing irritation and subsequent suppuration.

While I concede that empyema of the antrum may proceed from inter-nasal diseases, viz.: Acute or chronic rhinitis, nasal polypi, or any cause operating to produce occlusion of the ostium maxillare, yet, from experience and observation, I believe that fully eighty per cent. of cases of antral disease either directly or indirectly result from diseased teeth or their alveoli.

When we consider that the apices of the root of the superior molars and bicuspid, being in close proximity to the floor of the antrum, frequently penetrate it, and also consider the pathological changes of the teeth and their alveoli, these changes being alveolar abscess, pericementitis, pyorrhoea alveolaris, alveolar periostitis, otitis, fracture of alveolus from extraction of teeth, suppurative degeneration of dentigerous cysts, necrosis and caries, it seems rational that whenever the teeth and adjacent parts are subjected to aggravated and prolonged inflammation the sinus will also become affected and suppuration ensue.

There are numerous instances in which the production and discharge of pus in the sinus are so evenly balanced that there is no perceptible change of condition for months, or even years, the discharge of pus through the nares, together with the constant dripping from the posterior nares, being the only disturbing condition of which the patient is cognisant. This suggests catarrh, for which he is usually treated, but, unnecessary to add, without improvement. Not until a severe attack of acute rhinitis, or some constitutional disturbance intervenes, or until the ostium by some means becomes closed, is the true nature of the disease recognised.

In cases of this type the empyema is usually attributed to la grippe. When in fact, if the teeth upon the affected side were examined, there would invariably be found one or more necrotic teeth and roots together with chronic alveolar periostitis, la grippe merely aggravating the disease already existing.

Many cases of supposed empyema of the antrum, attributed to catarrhal inflammation, are simply catarrh of the sinus,



the inflammation disappearing simultaneously with the inflammatory condition of the respiratory tract.

Diseased teeth and their alveoli would be more infrequent with a corresponding diminution of antral suppuration were patients less desirous of preserving necrotic teeth and roots.

As evidence in support of my belief that diseased teeth and their alveoli are the most prolific sources of empyema of the antrum, I will briefly mention the cases treated by me during the past year. They are as follows :

1. Dentigerous cyst.
2. Fracture of alveolus following extraction of third molar. Patient syphilitic.
- 3, 4. Necrotic roots with more or less caries.
- 5, 6, 7, 8. Diseased teeth with more or less necrosis.
9. Chronic abscess on root of second bicuspid with perforation of sinus.
10. Second bicuspid and first molar involved with caries.

The last six cases were developed during an attack of la grippe. From indications they had been in a suppurative condition for some time previous to the attack, as no catarrhal inflammation had previously existed.

The symptoms vary with the exciting cause. Those usually present in cases where the ostium is closed as a result of nasal polypi, inspissated mucus, coryza or la grippe are, general febrile disturbance, rigours, pressure and distension of the walls of the sinus, dryness of nostril on affected side, frequently oedema of the cheek and severe pain in the orbital region, soreness and apparent elongation of the teeth, and severe pain usually extending from the central incisor along the alveolar border to the third molar. When the disease has passed to the second stage the only symptoms usually present are distension of sinus and increased flow of pus.

When suppuration results from diseased teeth many of the symptoms above mentioned are usually absent. But there will be a copious discharge of offensive pus from the nostril on affected side, especially marked when the head is inclined forward and sidewise on the unaffected side. The orifice

into the meatus is usually unobstructed,<sup>\*</sup> but in some instances it is found obstructed with inspissated mucus; the mucous membrane upon the facial surface is congested, and presents the appearance usually found in severe pericementitis, or periostitis; occasionally anosmia is present, and more or less crepitus upon pressure.

After establishing the diagnosis of empyema of the antrum, the morbid condition of the sinus usually yields kindly to simple, judicious treatment, notwithstanding the fact that opinions of practitioners are as widely divided upon this point as upon its etiology and diagnosis.

The surgical treatment consists in opening the sinus either through the nares or through the alveolus. Each of these methods has strong advocates, and the question confronts us,—Which produces the better results?

The advocates of the nasal operation frequently adopt that method in order to avoid sacrificing a sound tooth. But the opening through the nares does not afford the same facilities for cleansing and treatment as in the alveolar opening. Also, the patient usually manifests great reluctance in consenting to the nasal operation, which seems much more formidable than that through the alveolus.

I do not believe that the nasal operation is ever justifiable. In case of necessity there should be no hesitation in sacrificing a sound tooth for this operation. I have had no occasion to take this step, as no case ever came under my observation where perfectly sound teeth co-existed with empyema of the antrum. But should such cases occur, an opening could be satisfactorily made between the roots of the second bicuspid and the first molar. By preference, I should extract the second molar, as this would make an opening nearer the centre of the floor of the antrum; but if the roots of either the first or third molar, or the second bicuspid, should be necrotic, they should be removed. Should it seem desirable to extract the second bicuspid, the drilling should be upward and slightly backward, as at this point the floor of the antrum is thicker than at other points mentioned.

In case all the teeth on the affected side are missing, the opening should be made at the point corresponding to the location of second molar.

If the disease results from the closure of the ostium maxillare, or from any other cause than diseased teeth, all obstructions should first be removed from the natural orifice in the nares, after which an opening should be made at the apex of the roots between the second bicuspid and first molar.

After the opening is established the sinus should be thoroughly explored with a flexible probe which will readily conform to any inequalities, in order to ascertain whether the cavity contains any foreign substance, as spicula of bone or impacted teeth, or whether the antrum is divided into two cavities by a septum,—a condition which frequently occurs. If none of these conditions exist, the sinus should be thoroughly irrigated with tepid salt water until all traces of pus have disappeared. The cavity should then be treated with any of the well known stimulating and antiseptic remedies, and the opening into the alveolus should be hermetically closed by a tampon of antiseptic gauze or carbolised cotton.

In cases which do not readily yield to fluid medication curative results may be obtained by first thoroughly cleansing with tepid salt water, then carefully removing all moisture from the sinus and treating by insufflation.

In cases where necrosis and caries are present, all necrosed bones and caries should be removed. This will usually reveal a much larger opening than one made artificially. The sinus should be cleansed, as before mentioned, and packed daily with antiseptic gauze until the pus has perceptibly diminished in quantity, after which a semi-weekly dressing will be sufficient. When pus is no longer formed there is ample assurance that the disease is obliterated. The packing in the sinus should be discontinued, and a tampon should be placed in the alveolus, to be diminished at each dressing until granulation is completed.

In many articles written upon suppuration of this sinus, great importance is attached to the opening as a medium for

drainage. I disagree with the theory that drainage is an important factor in the treatment, and I further believe that drainage tubes should *never* be used in antral suppuration. As now employed, they are productive only of injurious results, serving as a medium by which food and pathogenic micro-organisms of the oral cavity enter the sinus, maintaining constant irritation, prolonging treatment, and retarding cure.

Further, these metallic drainage tubes being retained in position by ligatures attached to sound teeth, the ligatures invariably cause absorption of the alveolus, loosening of the teeth, and their premature loss.

Authors usually recommend the use of silver drainage tubes, but this metal should not, under any circumstances, be inserted into the antrum, as the action of pus upon it soon causes corrosion. In two cases coming under my observation the silver tubes became so greatly corroded that they slipped into the antrum and remained there for some time before removal, acting as a local irritant.

If metallic drainage tubes are ever employed they should be made either of gold or platinum.

The treatment of antral suppuration as above outlined, although simple in character, is the only treatment that I have found necessary to effect a cure.

#### DISCUSSION.

DR. E. D. FERGUSON said he wished to personally thank the author for this paper. The method of treating the antrum by packing instead of drainage by means of soft tubes was new to him; he would like to ask the size of the opening made through the alveolus.

DR. CARR said that in cases in which packing had been recommended either caries or necrosis had existed, so that there was usually an opening present as large as the little finger. If there were no necrosis, the opening would be made a little larger than a quill. The rubber tubing he had found useful.

## GENERAL SUGGESTIONS REGARDING THE DIAGNOSIS AND TREATMENT OF ACUTE AURAL INFLAMMATION.

By EDWARD B. DENCH, M. D., of New York County.

*October 15, 1895.*

The importance of acute inflammations of the external auditory meatus or middle ear has been recognised only at a comparatively recent date. Formerly a discharge from the ear at some period during child-life was a circumstance which attracted the attention neither of the physician nor of the parents. This explains the frequency of chronic purulent inflammation of the middle ear among adults and is also responsible for a large number of the fatal cases of purulent intracranial inflammation.

At the present time practitioners of medicine are recognising the gravity of acute inflammations affecting particularly the middle ear, not only on account of the serious results which may immediately follow but also of those which may make their appearance late in life. For this reason I beg your attention to a few remarks upon the diagnosis and treatment of these cases in the acute stage.

An acute inflammation involving the external auditory meatus or the middle ear usually declares itself in an adult by the access of severe pain in the ear; in infants however, we receive no aid from the patient as to the location of the pain, and the diagnosis must be made upon the general symptoms and confirmed by an examination of the suspected organ.

Passing over for a moment all the appearances which may be observed upon otoscopic examination, let us consider



briefly the evidences of an acute inflammation of the ear in a young child.

In the first place regarding the location of the inflammation it may be well to say that a primary inflammation of the external auditory canal in infancy is exceedingly rare. On the other hand, an acute inflammation of the middle ear occurs very frequently.

The history is ordinarily somewhat as follows: The child awakens at night screaming with pain, or in the mild cases tosses about the bed, crying out now and then without actually waking. The thermometer shows that the temperature is elevated—seldom under 102 F., and frequently rising to 104 or 105 F. These symptoms continue for several hours, after which the child may fall asleep and in the morning the pillow will be found stained with a slight serous discharge. If the case is a mild one no other symptoms make their appearance. The temperature becomes normal and the child appears perfectly well. If the case is more severe the child still continues restless, the temperature remains high, and the child refuses nourishment, loses flesh, and seems very ill. Usually a discharge from the ear follows and the symptoms subside, but quite often there is little or no discharge.

The only symptom then is the persistent high temperature, and in an infant such an elevation of temperature unaccounted for by any disturbance of the gastro-intestinal canal, or by any evidence of one of the acute infectious diseases, should immediately lead to a careful examination of the ear.

Before inspecting the organ by means of the speculum and head mirror, palpation may be of some value. As the bony canal is wanting in an infant, any motion communicated to the cartilaginous meatus by traction upon the auricle or by pressure in front of the tragus, is transmitted to the drum membrane. If there is an inflammation of the middle ear, such manipulation will naturally excite pain. This is only true of young children and the sign has an entirely different significance in adult life.

Coming now to adults and to older children, the statement of the patient that there is pain in the ear, is, of course, a most important symptom of an acute aural inflammation.

A word of caution may not be out of place here, however. Dental caries not infrequently causes an otalgia, and the pain incident upon the eruption of the permanent teeth is occasionally referred to the ear. It is always wise, therefore, to examine the mouth to determine the presence of these conditions, if otoscopy gives negative evidence, or if for any reason it is impossible.

Regarding the value of palpation in older children and in adults, we should remember that tenderness elicited by moving the auricle or by pressure in front of the tragus is almost pathognomonic of an inflammation of the external auditory canal, the sign being absent in cases of acute otitis media. In older children and in adults, also, the temperature may be but slightly or not at all elevated.

The evidences presented upon otoscopic examination are sufficiently well marked to be recognised by any person reasonably familiar with the use of the head mirror. In the infant, speculum examination is somewhat difficult, but in older children and in adults it can be easily made.

When the middle ear is inflamed in infancy, the appearance which most appeals to the observer is the extreme narrowing of the deeper portion of the meatus in the vertical diameter; in other words, the drum membrane cannot be recognised as a distinct structure and the superior wall of the canal seems to slope gradually downward until it merges into the inferior wall. The parts are uniformly reddened and the characteristic pearly white colour of the drum membrane is entirely wanting. Such a picture in connection with the symptoms already described warrants a diagnosis of an acute inflammation of the middle ear. The nicer distinctions which are evident to those more familiar with the technique of otoscopy will not be entered into here.

In the adult the appearances upon otoscopic examination differ according as the case is one of external otitis or of

inflammation of the middle ear. We meet with cases in which the introduction of the speculum into the canal is painful, and is effected only with great difficulty, owing to the narrowing of the meatus at its entrance. In these cases we also have tenderness upon pressure in front of the tragus, and severe pain upon moving the auricle; there may also be oedema over the mastoid. When at last the speculum has been introduced the drum membrane will be seen to present its normal colour, and the deeper portion of the meatus will appear of normal size—the lumen of the canal then is reduced only at the very entrance, the deep canal being normal and the view of the drum membrane being unobstructed. These conditions invariably indicate either a diffused or circumscribed inflammation of the external auditory canal.

In the second class of cases there is severe pain in the ear but external manipulation elicits no pain, and the introduction of the speculum is easily effected; the inflammation in such a case is in all probability located in the middle ear. If now the drum membrane is brought into view, it may appear either uniformly reddened or this alteration in colour may affect the upper portion alone. The entire drum membrane may bulge into the canal or the position may be fairly normal, or the upper and posterior portion of the membrane may bulge outward into the canal. In severe cases this protrusion of the upper part of the membrani tympani may be so marked that the upper and posterior portion of the fundus of the canal appears to be occupied by a dark red tumor and obscuring the corresponding area of membrani tympani; below this mass the membrane may appear fairly normal in colour, the area visible, however, being greatly reduced in its vertical diameter as compared with the normal membrane on account of the presence of the tumor. This appearance means an acute inflammation of the middle ear and often indicates the presence of fluid behind the membrane.

Given then in an adult a narrowing of the meatus close to its entrance, we are warranted in considering the case one of

acute external otitis, narrowing of the deeper portion of the meatus or redness of the drum membrane with or without displacement outward being equally characteristic of an inflammation of the middle ear.

Having established our diagnosis of an acute inflammation of the canal or of the middle ear, what are the measures for its relief?

The indications are to relieve the pain and to abort the inflammatory process. Early in the attack the local abstraction of blood is of undoubted value. From one to four ounces of blood should be withdrawn from the region immediately in front of the tragus, either by natural leeches or with the wet cup. The patient should be put to bed and if seen early in the attack a full dose, either of morphine, or of one of the preparations of opium, should be given internally, the object being to relieve the pain for a period of from four to six hours. Still further relief may be obtained by the application of dry heat to the ear. A convenient method of effecting this consists in the use of the ordinary hot-water bag, the Japanese pocket warmer, etc. Among the poorer classes a warm stove lid wrapped in flannel forms an efficient substitute for the more elegant appliances above mentioned. Small bags of salt, heated upon a warm plate, retain their heat for a long time and may be introduced into the meatus. They are conveniently made from the finger tips of an old glove. No fluid should be introduced into the external auditory meatus. In this connection we would lay particular emphasis upon the injury done in these cases by dropping warm sweet oil and laudanum into the ear. The introduction of any oleaginous substance into the auditory canal is particularly objectionable in these cases. It does no good and usually does absolute injury.

The injection of warm water is also objectionable in the early stages, because the object of treatment is to abort the inflammation; moist heat rather favours the disintegration of the tissues and should not be employed very early in the attack.

Under no circumstances should a second dose of morphine or opium be administered, as it may mask the evidence of the advance of inflammatory process and thus obscure the diagnosis.

If the pain continues, or if it disappears for a short time and then again becomes severe, we should not delay to make a free incision into the inflamed tissues.

It is never wise to wait for spontaneous evacuation of the inflammatory products in these cases as such an occurrence means extensive tissue necrosis. The object of early incision is not to evacuate the fluid products of inflammation, but to abort the pathological process before the tissues have broken down.

It may be urged that the use of the knife in this region is only safe in the hands of an expert. We cannot agree with this objection. A free incision of any tumefaction, either at the entrance to the meatus or in its deeper portion, can be easily effected by anyone possessing ordinary manipulative dexterity, and it is far less dangerous to operate than to allow the disease to progress unchecked. Such an incision should be free and has for its object the complete depletion of the engorged structures.

In the later stages the object of the incision is, of course, to evacuate the fluid products of inflammation and to prevent the infection of the adjacent parts.

Before proceeding to the operation, the external auditory meatus should be thoroughly irrigated with a warm solution of bichloride of mercury (1 to 5000), and the canal should afterwards be brushed out with an alcoholic solution of bichloride of mercury (1 to 3000). If the tumefaction is in the deep canal the point of the knife should be carried well beyond the obstruction, and should be made to cut its way upward and outward through the mass. The knife should be entered deeply until the point encounters the bony wall of the middle ear; it should then be carried upward, incising the tissues until the edge of the knife impinges upon the bony margin of the canal; the point of the knife is then kept in con-



tact with the superior wall of the bony meatus and is drawn outward until an incision one-eighth inch to one-fourth inch in length is made. If the tumefaction lies at the very entrance of the canal the knife is carried beyond the obstruction and the mass is incised throughout its entire length by cutting from within outward. No harm is done if a very long incision is made; on the other hand a simple puncture is worse than useless. After incision the canal should be syringed every two or three hours with a warm solution of bichloride of mercury (1 to 5000), the frequency of the irrigation being diminished as the discharge decreases in quantity.

This treatment has been severely criticised and may seem too radical, but a rather extensive experience has convinced me that when proper precautions are taken to sterilise the field of operation in the manner described and proper attention is paid to the cleanliness of the instruments used, that no harm results but that the outcome is eminently satisfactory.

The extension of the inflammation to the mastoid process almost never occurs when this plan of treatment is carried out, while in cases which are allowed to go on to spontaneous rupture such extension is comparatively common. Spontaneous rupture of the drum membrane means the complete destruction of all of its layers over the area involved. Even where this opening closes completely the fibrous layers of the drum membrane are imperfectly reproduced; the cicatricial tissue gradually becomes relaxed and constitutes a tension anomaly which may greatly impair the hearing in later life. Only too frequently, however, no such reparative action occurs, the suppurative process continues, and the case becomes one of chronic middle-ear suppuration.

Where the external auditory canal alone is involved free incision shortens the course of the disease and affords almost immediate relief to pain. Early incision lessens the possibility of a similar infection of the neighbouring portions of the meatus by the discharge from the primary focus of inflammation. It should also be remembered that while a

furuncle in the external canal ordinarily terminates favourably, cases occasionally occur in which the inflammatory process extends to the periosteum covering the mastoid, and finally to the bone itself.

Where cases are seen at a late period and where there is a discharge from the meatus, the indications are to allow a free exit to the secretion and to prevent infection of the surrounding structures. This object is most easily accomplished by frequent irrigation of the canal with a warm antiseptic solution.

It is important to watch these cases carefully and in children to record the temperature at frequent intervals in order to recognise immediately any obstruction to drainage. If this should occur a free incision and evacuation of the pent-up secretion should at once be resorted to.

In closing it might be said that if the general practitioner will manage an inflammation of the external or middle ear in exactly the same manner as he would manage an acute inflammation occurring in any other portion of the body, applying the rules of general surgery to this special region, that the results will be uniformly satisfactory.

## RECENT STUDIES ON DIPHTHERIA AND PSEUDO-DIPHTHERIA.

By WILLIAM HALLOCK PARK, M. D., of New York County.

*October 15, 1895.*

### THE CHEMICAL USE OF DIPHTHERIA ANTITOXINE.

The first publication demonstrating the antitoxine power of the serum of animals immunised against diphtheria in the treatment of experimental diphtheria, was made by Behring in December, 1890.

The first trial of antitoxine serum in human diphtheria was made in the autumn of 1891, in the city of Berlin.

The foundation for the treatment of diphtheria, and to a less extent of certain other diseases, with antitoxine, rests upon the fact,—and it is well to keep in view that it is a fact—that the blood and serum of animals immunised against certain diseases, contain substances, which, when injected into healthy animals, will give them immunity to the same disease. Further, not only will the serum give immunity to later infection, but will, if not given too late, prevent the otherwise fatal outcome of the disease in animals already ill. The result is much the same, whether the antitoxine is given to an animal before, or at the same time as, the dose of toxine or virulent bacteria, but varies greatly for each hour's delay in giving the antitoxine after the infection has taken place. The longer this period is, the greater the amount of antitoxine needed, and the more doubtful the recovery.

### MODE OF ACTION OF ANTITOXINES.

It seems probable that the antitoxine does not act directly in any way upon the toxine, but rather upon the tissue ele-

ments in such a way as to make them insusceptible to the poisonous action of the toxine.

After the cells have been to a certain extent affected by the toxine, the protective power of the antitoxine can no longer be exerted, and the lesions progress in spite of it.

#### DERIVATION OF THE ANTITOXINES.

From the fact that the antitoxine developed in the blood of an animal is only antitoxic for the special toxine with which it was injected, that is, tetanus antitoxine only immunises against tetanus poison, diphtheria toxine against diphtheria poison, it seems as though the antitoxine must be derived from the toxine. A diphtheria antitoxine of moderate strength has indeed been obtained from diphtheria toxine by electrolysis.

There are certain facts, however, which teach us that the living tissue elements probably are actively associated in the transformation. Thus in animals freshly immunised, small doses of toxine will produce far larger amounts of antitoxine than these same doses will produce when the animals have been long under treatment. The amount of antitoxine produced, seems to depend more on the extent of the reaction of the animal to the injections, than on the amounts of toxine introduced. The diphtheria antitoxine is obtained for medicinal purposes almost entirely from horses. These animals receive repeated doses of diphtheria poison, in constantly increasing amounts, until after two to four months their blood serum contains sufficient amounts of antitoxine to be serviceable for treatment in human diphtheria.

The power of the diphtheria antitoxine to neutralise the poisonous effects of the diphtheria toxine in animals is, as before said, an absolute fact which has been shown to be uniformly true in thousands of experiments. We have every reason to expect that since the toxine in human diphtheria is, so far as we can determine, exactly the same toxine as that in diphtheria in animals, that this power of the anti-

toxine to make harmless the toxine, will manifest itself in man under similar conditions.

We have every reason, therefore, to expect it to almost certainly prevent, for a time at least, an attack of diphtheria, but as to its exact value at different stages in the development of the disease, only clinical experience can determine.

If, as Welch<sup>1</sup> states, the curative effects of the serum are brought about through the agency of the living cells of the body, we can understand why these effects will not follow the injection of the serum with a certainty and precision of a chemical reaction. The cells must be in a condition to respond, in a proper way, to the introduction of the antitoxic serum. For one reason or another, this responsive power may be in abeyance; we know that it may be weakened, or destroyed, by the intense or prolonged action of diphtheria poisons, or by other previous and co-existent diseases, or by inherent weakness, or there may even be some individual idiosyncrasy which hinders the customary response of the cells to the antitoxine.

Clinical experience shows that cases of diphtheria inherently refractory to antitoxic serum are exceptional, although they do certainly from time to time occur.

The antitoxic serum exerts no bactericidal effect upon the diphtheria bacillus, although when administered in proper quantities sufficiently early in the disease, it arrests the spread of the local inflammation which is caused by the bacillus.

Virulent bacilli, so far as the results in New York go, seem to persist in the throat for about as long a period as in the cases formerly not treated with antitoxine.

One of the most important characters of antitoxine, is that it requires a definite quantity of this substance to neutralise the effects of a definite quantity of toxine.

In animals, the curative dose of antitoxine stands in a definite quantitative relation to the size and susceptibility of the individual, and to the amount and intensity of the poison in the system.

<sup>1</sup> Dr. William H. Welch, Bulletin of the Johns Hopkins Hospital, July, 1895.



If an animal does not receive a sufficient amount of antitoxine, it frequently dies almost as quickly as one having received no antitoxine at all.

We have no method of determining how much and how virulent the poison may be in a given case of human diphtheria, nor how susceptible to toxine the patient may be. The dose of antitoxine, therefore, in human diphtheria is empirical, the main factors to determine it being the age of the patient, the estimated duration of the disease up to the time of the administration of the remedy, and, most important of all, the severity and extent of the disease.

As the serum is capable of inducing unpleasant symptoms, it is desirable not to give an excessive quantity. It is, however, necessary not to err on the opposite side, and give too little, for it is far more important to give sufficient to overcome the dangers than to endeavour to avoid, by too small a dose, the after possible unpleasant effects.

It is very important to bear in mind that the diphtheria antitoxine only immunises against the poison of the diphtheria bacilli, and that, in so far as the lesions in any case of diphtheria are due to the action of the poisons produced by other bacteria, that these lesions will be in no way influenced.

The lesions of diphtheria are, as a rule, at the beginning mainly due to the action of the toxine of the diphtheria bacillus, but later a streptococcus inflammation may take place, due to other bacteria, so that septicaemia or a pneumonia may develop, which, being due not so much to the diphtheria bacilli as to the streptococci, or pneumococci, will of course advance without regard to the use of the diphtheria antitoxine.

These facts impress us still further with the importance of using the antitoxine early, for we are not only thus enabled to immunise the cells against diphtheria toxine, but by preventing the advance of the disease we ward off these latter infections.

We have no way of gauging accurately at any given period of the disease the extent of the damage already inflicted upon

the cells of the body. If the nerve cells have already been so damaged that paralysis must follow, or the cardiac nerve cells, or muscular fibres, have been similarly injured, or the renal epithelium so affected that degeneration and nephritis ensue, the administration of antitoxine cannot restore those cells which are already on the way to degeneration and death.

The effects which follow the injection of the anti-toxic serum in individual cases are not new and strange. Nothing happens which the physician may not have occasionally seen to happen in cases treated in the ordinary way. In severe, as well as in slight, cases of diphtheria, he may have seen an apparently progressive local process quickly arrested and the general symptoms promptly abated.

But, as Welch puts it, why should anything new and strange happen after the administration of antitoxine? Cure by antitoxine is, if our theories are correct, by nature's own remedial agent. That which is new and strange is the frequency with which, in case after case, the early injection of antitoxine promptly arrests the local inflammation and checks the constitutional disturbances.

Recovery following treatment by antitoxine is such a natural kind of recovery that in any good case a physician may repeatedly have the feeling that the whole thing might have happened without the use of the remedy. We can, therefore, understand why it should be as a rule those with the advantages of a large experience in the treatment of diphtheria by antitoxine, who are most decided in expressing their opinion as to its beneficial effects.

#### THE ANTITOXIC SERUM.

The serum should be clear and free from any bacterial growth. Each cubic centimetre should contain at least 100 units. When possible, serum of twice that strength of antitoxine should be used.

#### MEASURES OF ANTITOXINE VALUE.

An antitoxine normal unit is ten times the amount of serum required to protect a Guinea pig weighing 250 grammes from

death when ten times the fatal dose of toxine is mixed with the serum and the mixture injected subcutaneously into the animal. As measured by Roux's method, 50 antitoxine normal units are about equivalent to one c.c. of serum having a protective power of 1 to 50,000. The contents of phial No. 1 are therefore about equal to 12 c.c. of a serum 1 to 50,000. The contents of phial No. 2 about equal 10 c.c. of a serum 1 to 100,000 or 20 c.c. of a serum 1 to 50,000. The serum is usually put up in vials of from 5 to 10 c.c., each cubic centimetre having from 100 to 250 antitoxine units.

#### DOSE.

The size of the dose, I believe, should be measured, chiefly by the extent and intensity of the disease; also, but to a less degree, by the size of the patient and the duration of the illness. For young children with but moderate lesions of tonsils or palate a single dose of 800 units, 8 c.c. Behring's standard No. 11 solution, will suffice, or 15 c.c. of a 1 to 50,000 solution Roux. For older children and adults, 1,000 units should be given. In children who are already seriously ill or who already show the toxic effects, or in whom the larynx is involved, a dose of 1,500 to 2,000 units, 10-14 c.c. No. 111 is necessary.

If the symptoms do not abate, another 1,000 to 1,500 units may be given on the following day. In a few cases still a third injection is required. Exceptionally a week or ten days after administering the antitoxine, a slight return of exudate may appear; here another moderate injection is indicated. Where these doses have not benefited, it is doubtful if larger ones will succeed.

At the hospital for several months one half of the severe cases received on admission 3,000 units and again on the following day 3,000 more. If no improvement followed a third 3,000 units were given.

The other half received 2,000 units on admission and a second 2,000 in 18 hours. So far as one could tell, those receiving the lesser amount did as well as those receiving the

very large amounts. On the other hand no bad effects were noticed from the larger amounts.

#### IMMUNISATION.

When children or adults have been much exposed to diphtheria they may be protected by the administration of from 100 to 300 antitoxine normal units. The protection will probably not last more than from three to eight weeks. The remedy is administered by deep hypodermatic injection, a special large syringe being preferably employed for the purpose (although an ordinary hypodermatic syringe, carefully cleansed, may be used, the barrel of the syringe being repeatedly filled).

Some point on the anterior surface of the body should be chosen for the injection, where there is an abundance of subcutaneous cellular tissue, as the anterior surface of the abdomen or thorax, or the outer surface of the thigh. Before the remedy is administered the skin should be carefully washed with alcohol or some disinfecting solution.

The syringe should be carefully sterilised. The solution is rapidly absorbed and it is better not to employ massage over the point of injection.

#### THE RESULTS OBTAINED IN TREATMENT.

The use of antitoxine in diphtheria is so recent that it is still under discussion. It therefore seems to me wise to give certain reliable statistics so that readers may themselves to a certain extent have a basis for forming their own opinions. I shall choose to report for this purpose the figures from two hospitals. First from the Willard Parker hospital of New York city, where all cases of diphtheria occurring in New York, and needing hospital treatment, are sent.

I choose this hospital because I have watched nearly all the cases personally and know about the results before the use of antitoxine. For the second hospital I have chosen the Kaiser and Kaiserina Friedrich hospital of Berlin, because

Baginsky<sup>1</sup> has reported these cases in such a thorough manner, and because the figures show what we can hope to accomplish under favourable conditions. First I will give a statistical summary of the results obtained in the treatment of diphtheria with antitoxine at the Willard Parker hospital during the year 1895, as contrasted with the previous year.

Mortality in Willard Parker hospital, during 1895, when antitoxine was employed in all cases, and in 1894, when it was employed in but few:

All cases included.	1895.			1894.		
	Cases.	Deaths.	Percent- age.	Cases.	Deaths.	Percent- age.
First quarter.....	156	52	33.33	147	53	36.05
Second quarter.....	256	75	29.29	214	83	38.78
Third quarter.....	181	28	15.47	108	29	26.83
Fourth quarter.....	.....	.....	.....	.....	.....	.....
Totals.....	593	155	26.14	469	165	35.18

It is necessary to state here that the cases were admitted under exactly the same conditions during 1895, as in previous years. As seen in this table, in the fourth quarter of 1894, the mortality was high. Indeed during the month of December all of the twelve intubated cases died. There is no reason to suppose that the epidemic was of a milder character when the use of antitoxine was begun. There were through the winter months an unusual number of laryngeal cases.

The next table is of great value. It shows that the epidemics of 1895 were of about the same severity, the cases admitted after the beginning of the fourth day having about the same mortality in both years. The cases admitted, however, on the first two days, show a very different mortality. This is true, also, but to a less marked extent, for the cases in

<sup>1</sup>The serum therapy in diphtheria by Dr. Adolph Baginsky, Berlin, 1895.



which treatment was begun on the third day. Too much emphasis cannot be placed upon the importance of giving antitoxine early in diphtheria. There is no doubt in my mind that most cases which die in spite of the early administration of the usual treatment, would be saved if antitoxine was given within the first thirty-six hours of visible disease.

DEATHS ACCORDING TO DAY OF DISEASE UPON WHICH TREATMENT WAS BEGUN.

Antitoxine.	1895.		No Antitoxine.	1894.
Day upon which treatment was begun.	Cases.	Mortality Percentage.	Cases.	Mortality Percentage.
First and second day.....	108	10.09	43	26.67
Third day.....	130	25.19	120	33.61
Fourth day.....	116	34.19	111	35.40
Fifth day.....	87:355	31.82:33.8	74:306	35.53:35.9
Over five days....	152	36.64	121	36.29
Totals.....	593	26.14	469	35.18

MORTALITY ACCORDING TO AGES OF PATIENTS.

	1895.		1894.	
	Cases.	Mortality.	Cases.	Mortality.
Under two years .....	101	70.59 pr ct.	89	70.07 pr ct.
Two to four years .....	129	41.54 "	116	46.28 "
Four to six years .....	101	19.61 "	87	36.96 "
Six to eight years.....	66	14.93 "	54	23.73 "
Eight to ten years.....	30	3.23 "	31	11.11 "
Ten to twelve years .....	24	4.00 "	12	7.14 "
Twelve to fourteen years....	28	0.00 "	6	0.00 "
Fourteen to sixteen years....	19	0.00 "	4	0.00 "
Above sixteen years.....	95	6.00 "	70	4.00 "
Total.....	593	26.14 pr ct.	469	35.18 pr ct.

The results shown in the treatment of diphtheria during the first four years of life are not so encouraging as those published from other hospitals. During the winter and fall

months a great many of the intubation cases developed a late broncho-pneumonia and died. Although, therefore, very few laryngeal cases died early in the disease, as most of these cases did last year, yet a considerable proportion of those apparently recovering died late of pneumonia. I believe certain conditions in the hospital to have accounted for this prevalence of pneumonia.

## LARYNGEAL DIPHTHERIA.

Cases.	1895. August— Dec. 31.		1894. August—Dec. 31.		
	Received.	Died.	Cases.	Recovered.	Died.
Intubated.....	.....	.....	36	4	32
Not intubated.....	.....	.....	13	9	4
			49	13	36

In spite of the prevalence of pneumonia there is still a considerable improvement in the number of recoveries this year with the use of antitoxine.

Let us now turn our attention to the statistics reported by Baginsky. They certainly give a very favourable showing for antitoxine.

Baginsky reports the following as the results of the treatment of diphtheria before and after the use of antitoxine :

Year.	Cases receiving no Antitoxine. 1890-94.			Cases receiving Antitoxine. 1894-95.		
	Cases.	Deaths.	Percentage.	Cases.	Deaths.	Percentage.
0-2	243	154	63.36	87,	22	25.28
2-4	333	176	52.85	146	25	17.12
4-6	274	104	37.98	116	20	17.24
6-8	197	54	27.41	79	9	11.39
8-10	124	24	19.35	58	3	5.17
10-12	73	11	15.07	20	2	10.00
12-14	43	6	13.95	15	2	13.30

His latest statistics for March 15–August 31, are even better.

Year.	Cases.	Deaths.	Per cent. Mortality.
Under two years.....	24	3	20
Two to four.....	49	3	6.1
Four to six.....	51	5	9.8
Over six years.....	100	8	8
Total cases .....	224	21	9.37

FOR LARYNGEAL DIPHTHERIA.

	Cases.	Deaths.	Per cent. Mortality.
Intubated.....	25	5	20
Tracheotomised .....	11	8	72
	36	13	30½
Not intubated.....	11	0	0
Total laryngeal cases .....	47	13	23

The mortality for the same six months for the past four years, without antitoxine, was 32½ per cent., while for this six months it was but 9.37.

A most convincing demonstration of the power of antitoxine is furnished by the experience of Baginsky during an involuntary pause in the serum treatment, caused by failure in the supply of serum. Between March 15, 1894, and March 15, 1895, there were treated in Baginsky's service, by antitoxine, 525 children, with a fatality of 15.6 per cent. During the period of forced interruption of the serum treatment, this period being chiefly the months of August and September, 126 children were treated without antitoxine, with a fatality of 48.4 per cent. There was absolutely no selection of cases in either group. In his comments upon this experience Baginsky says:

“It is all the more remarkable, as the ratio of mortality of those treated with the serum, both before and after the

period of interruption, varied within very small percentage figures. If one will permit figures to speak at all, there has scarcely been made on human beings a more demonstrative test of the curative power of a therapeutic agent. It was an experiment forced upon us, but it proved to us how terrible was the form of disease which we were treating, and how numerous would have been the victims without the use of the healing serum."

So far as I can judge, from memory and from the hospital records, the cases admitted this year to the Willard Parker hospital were fully as severe as those last year. The number having laryngeal diphtheria is, as before stated, greater, and these are the causes which contribute the majority of the deaths. It should be stated here that the cases admitted to this hospital are as a rule very unfavourable for obtaining good results from antitoxine. Not more than four per cent. come for treatment during the first twenty-four hours, and many are sent in already thoroughly exhausted from the prolonged obstruction to their breathing. Baginsky also reports that the cases in his service are of nearly the same severity as those of the pre-antitoxine period, except that more of the cases come early for treatment. His results are very similar to those seen by me in private practise.

The high mortality in Baginsky's service during the period of the enforced interruption of the treatment, appears to prove that he is right in estimating the severity of the cases as about the same as before the antitoxine was used. Another proof that the cause of the lower death rate is not due to the cases being milder, is seen in the universal lowering of the death rate in laryngeal diphtheria. I quote again, a paragraph from "Welch's Summary:"

"No one can claim that laryngeal diphtheria, requiring intubation or tracheotomy, is anything but a severe disease. If the benefits of antitoxine are unmistakably manifested in these operated cases of croup, then the test is an *experimentum crucis*, and puts an end to the objection of those who assert that the apparently favourable results of serum

therapy in diphtheria, are attributable mainly to the large proportion of mild cases treated. The fatality of intubated cases treated with antitoxine, is 28.9 per cent., which is 10.9 per cent. less than the fatality of tracheotomised cases.

"Before the introduction of the serum treatment, a collective investigation was set on foot by the German, *Gesellschaft für Kinderheilkunde*, to determine the average fatality following intubation.

"In 1893, Von Ranke reported to the society that 1,445 cases of diphtheria, with laryngeal stenosis treated by intubation, gave a fatality of 62.5 per cent. This result was interpreted in favour of intubation as opposed to tracheotomy. There is a difference of 33.6 per cent. between this percentage and that obtained from our 342 intubation cases treated with antitoxine. This difference is so great that, after making all possible allowance for differences in the series of cases entering into the two groups of statistics, it seems impossible to explain it otherwise than as a powerful additional support of the arguments already presented in support of the claims of antitoxine. Here, certainly the objection that the cases treated by antitoxine were light ones, cannot be made."

By this calculation we find the actual fatality to be 31.6 per cent., and the estimated fatality 62.4 per cent. In other words, there was an apparent reduction in the fatality of intubated cases of 49.5 per cent., as the result of the serum treatment. However distrustful one may be of statistical evidence in therapeutics, and previous experience justifies much distrust, I fail to see on what credible assumption this striking reduction of fatality can be explained, otherwise than as demonstrative of the specific curative power of antitoxine in diphtheria.

During the enforced two months' interruption of the serum treatment (August and September), in Baginsky's service, there were 116 cases of laryngo-stenosis with a fatality of 62.2 per cent., as opposed to a fatality of 37.8 per cent. in the serum periods which preceded and followed the pause.



The percentage of operations rose to 55.2 as opposed to 18.1 per cent. during the periods of serum treatment, and this without any change in the general character of the cases admitted.

During the serum periods there were more intubations than tracheotomies, whereas during the pause there were forty-five tracheotomies and nineteen intubations, thirteen of the latter requiring secondary tracheotomy.

The use of antitoxine in New York city began to be employed in a considerable proportion of the cases in January, 1895, the following table showing case fatality in diphtheria and croup in New York city, for the period January 1, 1895, to October 6, 1895, (during which antitoxine was employed), as compared with the period between January 1, 1894, and October 6, 1894, in which little or none was employed, is therefore of interest, as showing the lower mortality in 1895.

## PERIODS OF FOUR WEEKS.

	1894.	1895.
January 27.....	43.30 per cent.	25.77 per cent.
February 24.....	39.43    "	24.43    "
March 24.....	34.20    "	20.31    "
April 21.....	36.00    "	20.68    "
May 19.....	35.96    "	20.76    "
June 16.....	30.80    "	20.58    "
July 14.....	27.06    "	17.23    "
August 11.....	30.51    "	19.83    "
September 18.....	33.15    "	23.74    "
October 6.....	29.76    "	18.93    "
Total cases.....	6,878	7,475
Total deaths.....	2,337	1,582
Average case fatality.....	33.99 per cent.	21.15 per cent.

Lowest record of any year since 1885, (diphtheria only) 1889, 25 per cent. First 3-4 1895, 17 per cent.

Average, 1891-'94 3-4 year, 34.66 (diphtheria).

1895 3-4 year, 19.43 (croup).

Leaving statistics, let us look more closely at the results noticed in individual cases.

## THE BENEFICIAL RESULTS OF ANTITOXINE.

*Upon the local process.*—In the cases in which I have made, or seen an injection made, within the first twenty-four hours of the disease, the results have been so remarkable that I have attributed them to the antitoxine. Following are the histories of two typical cases :

A boy eleven years old had had for twelve hours malaise, with pain on swallowing. Inspection showed the tonsils and portions of the palate to be covered with a soft, slightly adherent exudate. The boy was injected with 1,000 units, and twelve hours later his throat was clear, and temperature normal. I do not believe this would have been a severe case without antitoxine, but the effect seemed magical.

The second case was a baby one year old, with a slight croupy cough for twenty-four hours, and stenosis just beginning. Temperature 102, restless, and without desire for food. Injected 500 units, and found the baby the following morning practically well.

When the disease has progressed several days, and these cases are the ones seen in the hospital, the benefit is not so apparent. I believe, however, that a marked effect is still produced. There have been very few cases indeed of pharyngeal or tonsillar diphtheria in which the membrane has increased after admission. I believe that the same result has taken place in laryngeal diphtheria. Even in well-developed cases the pseudo-membrane itself has seemed to me to separate somewhat more quickly than formerly, there being usually seen, after thirty-six to forty-eight hours, a line of demarcation separating the membrane and making it look like a slough ready to be cast off. The swelling of the throat tissues and of the glands of the neck also appears to me to begin to abate earlier. The ulcerated surface left in some cases, after the separation of the membrane, is covered with a soft exudate until healing occurs some days later.

In laryngeal diphtheria, if the intubation could be put off for eighteen hours, it was, with very few exceptions, avoided altogether. The time during which the cases remained intu-

bated seemed to me to be shorter than before the use of antitoxine. Many children coughed up their tubes in from twelve to forty-eight hours, and quite a number were able to do without them afterwards. Others required the tube from three to eight days. Exceptional cases occurred as previous to the use of antitoxine, when the tube had to be worn for weeks. The general condition of patients was beneficially influenced. The loss of appetite and the apathetic condition are less apt to occur, and when present seem more quickly relieved. In cases in which treatment was begun very late, as a rule no good effects were noted.

*The ill effects of antitoxine serum.*—A small percentage of the cases have a slight rise of temperature immediately after an injection. In a very few cases abscesses develop at the seat of the injection. This is a preventable accident.

*Rashes.*—These are peculiar to the serum injections. They are undoubtedly partly due to the horse serum, not altogether to the antitoxine. They occur in from five to twenty per cent. of the cases, according to the characteristics of the serum. The eruption may be limited to the point of injection, or may, more or less completely, cover the whole body. It most often appears as an urticaria, but may closely resemble scarlet fever or measles. In some cases, all the forms may be united in one person. Following the eruption, desquamation may occur. In about one fifth of the cases, there is a rise in temperature of from two to four degrees. This lasts from one to three days. In a small percentage of cases there is, accompanying the rash, great tenderness over the joints of the extremities. These pains last, as a rule, one to four days. In one case in the hospital, the joint affection was more serious. The child, aged fifteen months, was admitted on April 25, with severe stenosis. The temperature was 101. The child was intubated and did well. It received two injections of 1,200 units each. On the twenty-seventh day there was a macular eruption over the body; twenty-four hours later the joints of the hands and feet became intensely painful. The child dreaded the least

handling. The knees, and the two joints of the left thumb, became more swollen, and appeared like acute articular rheumatism. Before the eruption developed, the child's condition was rendered more serious by the development of a broncho-pneumonia, which continued gradually to increase until death, two weeks later. There have been, in New York, four cases reported, in which the joint lesions persisted for several weeks. These all finally recovered. The urticaria and erythema, which at times accompany the rise in temperature, is in certain cases very distressing, and, in a person already prostrated, might not be wholly without danger to the patient.

I have seen no serious effects upon the heart, kidney, or nervous system which I lay to antitoxine, with the possible exception of two cases of scarlatina complicated with diphtheria. In these two, there was an almost complete suppression of the urine. This was probably due to the scarlet fever and diphtheria, and not to the antitoxine, but it teaches that care should be taken in the use of large injections of antitoxine in scarlatina complicated by diphtheria.

Since it has been suggested, by some, that injections of antitoxine with the accompanying horse serum have a disinintegrating effect upon the red cells of the blood, we investigated the matter very carefully in the laboratory of the health department.

Doctor J. S. Billings, Jr., one of the assistant bacteriologists of the department, examined very carefully the blood in fifteen babies after they had received doses of antitoxine for immunisation. The children received from 200 to 400 units each. No alteration was discovered in character of the red or white blood cells. The number of the white cells practically remained unchanged. The number of the red cells showed, however, in half of the cases, a very interesting change; in seven of the fifteen a gradual diminution in their number took place from day to day until, by the sixth day, there was a loss of from 200,000 to 600,000 in each 5,000,000 of their cells. After this date the number rapidly increased,

until upon the fourteenth day the numbers had returned to their normal amount. In an adult receiving 1,200 units the same result took place. From 6,000,000 the count dropped to 5,400,000, and then returned to the normal at the end of ten days. None of these persons showed any evidences of anaemia except in the examination of the blood. The cells contained their normal amount of haemoglobin. The blood of a number of cases of diphtheria treated with antitoxine was compared with that in a number in which no antitoxine was used. The diminution in the number of the red blood cells was greater in those not receiving the antitoxine. No marked effect was noticed upon the number of the white cells.

*The limitations of antitoxine.*—Diphtheria antitoxine, so far as we know, has no action upon the cells in causing them to resist any poisons other than those produced by the diphtheria bacilli. Here we see at once a limitation in the cure of the complex disease called diphtheria, for it is as correct, for instance, to class some of the cases met with as pneumonias complicated with diphtheria, as to call them diphtheria complicated with pneumonia. Upon the pneumonia, so far as it is not due to the diphtheria bacillus, we cannot hope that the antitoxine will have any curative effect. Another limitation is suggested by the results of experiments in animals. We know that after the infection has proceeded but a moderate distance it cannot be arrested by antitoxine. Experience seems to show that in human beings also the cells no longer react to antitoxine after a certain degree of poisoning has taken place, and this point, in some cases, seems to occur very early. I doubt if we are justified in saying that in these the actual lesions have progressed so far, that, without any further poisoning, life has become impossible. I believe it may be possible, that, even after the administration of antitoxine, the poison goes on producing further lesions, the cells already affected by the toxine not responding to the antitoxine.

There are cases in which, even when the antitoxine is



given early, it apparently fails to fortify the cells against the diphtheria poison.

In the hospital, the effects of antitoxine upon laryngeal diphtheria, though in one way striking, are in another disappointing. More children live than formerly, but it seems as though still more should live. Many survive the acute infection but many develop broncho-pneumonia later, and die. It has occurred in cases of diphtheria treated with antitoxine just as in cases not so treated, that a relapse may take place four or five weeks after recovering from the disease.

This pneumonia is much less frequent in private practise, and seems to be less frequent under hospital treatment abroad. As before stated, some special hospital conditions were probably accountable for it.

The following case illustrates a class of cases which end fatally, and yet, although we know the disease is thoroughly established, and the patients are under the influence of the toxine, we cannot help feeling disappointed when they do not respond to the antitoxine:

Alice M., aged sixteen years, a girl strong and well nourished, was admitted to the hospital on the third day of her illness; the glands of her neck, both tonsils, and the peritonsillar tissues were greatly swollen. The whole area, extending back into the pharynx, was covered by a thick, dirty-white, adherent membrane; her nostrils were partially obstructed; temperature 99, pulse 108. Her intellect was clear; 1,000 units of antitoxine injected; same amount injected twenty-four hours later. Thirty hours after her admission the swelling and infiltration were much less; membrane had lessened, and was of more benign character. Her heart was irregular, but patient felt better; temperature was 99 and pulse 110. Four days after her admission, her heart action became much more irregular, and her pulse was but 66, falling the next day to 34. Patient had repeated attacks of heart failure; all nourishment was vomited, so that stimulants had to be given by rectum. Patient died on fifth day of stay in hospital. Autopsy showed extreme fatty degeneration of the heart, and extensive degeneration of the other organs.

THE USE OF DIPHTHERIA ANTITOXINE IN PREVENTING  
BY IMMUNISATION THE DEVELOPMENT OF  
DIPHTHERIA.

The results obtained in a number of children's asylums and hospitals, and in the crowded tenements of New York, have been very favourable. They encourage the hope that a general use of antitoxine for immunisation will, to a large extent, limit the spread of diphtheria. At the Mount Vernon branch of the New York Infant Asylum, a case of diphtheria developed on February 18, 1894. Cases continued to develop from time to time, so that in September alone fourteen cases occurred. From that time until January 14, there was hardly a day in which a case did not develop. On January 16 and 17, 221 children were each injected with from 100 to 200 units Behring's serum. No bad effects were seen, and during the next month but one case of diphtheria developed. This was on the fourteenth day. From February 22 to February 27, five cases appeared, and the children were again immunised. This time they each received from 125 to 225 units Behring's standard of a serum prepared under the direction of the New York city health department.

No case appeared after the second immunisation for a period of five weeks. Cultures made from the throats of those in the neighbourhood of this case, showed diphtheria bacilli in the throats of six of the children. These six were given 200 units each on March 30. One of these children developed a tiny patch two weeks later, but had no constitutional symptoms. A case developed on May 3, and one on May 27, in the children immunised on February 27. The hospital has remained since then free of diphtheria, so that no third general immunisation has been thought necessary.

At the Nursery and Children's Hospital, in the three weeks preceding April 18, 1895, there were fifteen cases of diphtheria. Upon that day, 136 children, varying in age from three weeks to four years, were immunised by receiving from 50 to 200 units each. The children showed no bad

effects from the injections. A temporary rise in temperature occurred in one fourth of them, which lasted for six to twelve hours. From the day of the injections to the present time, no diphtheria has developed in the hospital, with two very interesting exceptions—a physician and a nurse who had not been immunised. Since then the hospital has been free of diphtheria.

At the house of reception of the New York Catholic Protectory, two cases of diphtheria developed on July 7, and three cases on July 8 and 9.

On July 9 and 10 the remaining 67 children were injected with 150 to 600 units each. (The children's ages varied between two and one half and fifteen years.) No diphtheria developed after the injections in any of these children. In August a new batch of children were received, and August 5 a case of diphtheria developed among these, and on August 10 a second. On this day the 37 children which comprised the new lot were injected with from 200 to 600 units. No more diphtheria developed.

The dosage was graded as follows :

Two years.....	1 case,	200 units.
Three years .....	1 case,	250 units.
Six years.....	1 case,	350 units.
Seven to twelve years.....	20 cases,	400 to 500 units.
Thirteen to twenty years.....	14 cases,	500 to 600 units.

The injection having been made in the forenoon, most of the children showed temperatures of from 99 to 99.5; the same evening two or three reaching 100 and one 100.6. During the two days on which observations were made, most of the temperatures subsided to normal, a few remaining at 99. No cases, except those mentioned later, showed any constitutional symptoms after the injections. In only two cases was there any local irritation. In one of these, the symptoms promptly subsided without treatment; the other, unfortunately, developed an abscess.

In the last group of cases, thirty-seven in number, specimens of urine were obtained before the injections to compare

with those taken after the administration of the serum. The results of the examinations are as follows :

Before Immunisation. August 9.		After Immunisation. August 11.			August 13.
	Sp. gr.	Albumen.	Sp. gr.	Albumen.	Albumen.
Felice Ferole ....	1,022	Trace.	.....	Negative.	Negative.
Patrick Donovan. ....		Negative.	1,030	Trace.	"
Joseph Dillon. ....		"	.....	"	"
Francesca Viria. ....		"	.....	"	"
Annie DeBorger..	1,024	30 pr ct. in vol.	.....	60 pr ct.	"
Jennie DeBorger. ....		Negative.	.....	16 pr ct.	"

One child showed thirty per cent. in volume of albumen (the urine, after boiling and the addition of nitric acid, was allowed to stand for twenty-four hours, and the amount then estimated) in the urine before the treatment, and after the injection about sixty per cent. in volume. The urine from the sister of this child showed no albumen before the injection, and gave the slightest evidence of illness other than the albuminuria at any time, and neither showed any temperature reaction. In both of these cases, as in all the others, the albumen had entirely disappeared two days later. Nine days after the injections, one case developed an urticaria which lasted for twenty-four hours. No other cases showing the skin-rashes were observed. At the reception house of the Juvenile Asylum, four cases of diphtheria developed during the week ending April 11. On the 12th, the children (about seventy) were injected with from 200 to 400 units.

No cases occurred afterwards, except that the boys' attendant, and an engineer who handled the clothes from the diphtheria children, and who had received immunising injections, developed diphtheria.

To me these results seem conclusive as to the immunising power of injections of from 100 units of antitoxine.

Although in these institutions it was impossible to say that any special child would develop diphtheria, still it was an absolute certainty, that, in each of these institutions, more cases would have developed unless in some way the children could be immunised.

About one sixth of the children developed slight albuminuria, and a much smaller percentage developed it to a greater extent. In none, however, were there any other symptoms pointing to any deleterious action on the kidneys and in none was the albuminuria more than transitory.

On the blood there was noticed, as before stated, a slight temporary diminution in the number of the red blood cells; no other changes were noticed.

#### IMMUNISATION BY HEALTH-DEPARTMENT INSPECTORS IN INFECTED FAMILIES.

For some months past in families in which diphtheria has occurred, and in which there were other children exposed to infection, the department inspectors, acting on their own judgment as to the necessity, have immunised some of these exposed persons. Most of these cases have been among the tenement-house population. A few cases, taken at random from the reports of the inspectors, illustrate the method :

**FAMILY I.**—Five children in family; two cases of diphtheria; the other three children, aged nine, eleven, and thirteen years, were immunised; no further cases occurred.

**FAMILY II.**—Three children in family; one case of diphtheria; two other children, aged eight and sixteen years, immunised, one child had diphtheria-bacilli in the throat at the time. No further cases of diphtheria.

**FAMILY III.**—Three children in family; one case of diphtheria; one of the remaining two children immunised; second child, aged sixteen, not immunised. This child developed diphtheria three weeks later, and was successfully treated with the antitoxine.

Cases like the foregoing might be repeated almost indefinitely; 232 persons had been immunised in this way up to October 1, and of these at least 93 (many of the others were



not examined bacteriologically before being immunised) had diphtheria-bacilli present in their throats when treated. The cases were kept under observation until the premises had been disinfected, and this was done until the throats of all were free from bacilli.

Among these 232 persons, three developed membranous croup within twenty-four hours of the time when they were treated, these had, in fact, diphtheria before being injected; all recovered. Three others had mild pharyngeal diphtheria, developing, one on the 19th, one on the 30th, and one on the 31st day after injection, and one developed a fatal diphtheria on the 55th day.

The cases detailed number, altogether, 1,043; 224 of these were immunised with Behring's serum, and the second time with the New York health department serum. In a large percentage of the whole number, diphtheria bacilli were present in the throat when the serum was administered, and all had been exposed to diphtheria under conditions more or less favourable for the transmission of the disease. Among those immunised, three cases of diphtheria occurred between 1 and 30 days after the treatment; *i. e.*, one on the 12th, one on the 17th, and one on the 19th day, respectively.

Twelve cases developed diphtheria later as follows: on the 30th day, two; 31st day, one; 33d day, one; 37th day, one; 39th day, one; 40th day, two; 42d day, one; 52d day, one; 55th day, one; 66th day, one; 90th day, one. The four cases that developed croup within twenty-four hours of the injection undoubtedly had the disease at the time of injection.

Altogether, therefore, excluding these, 16 cases of diphtheria occurred among 1,014 persons—three in from 1 to 30 days, and 13 in from 30 to 110 days after immunisation. These cases were all mild, excepting two, one of which proved fatal from diphtheria, and in the other death seemed to be due to broncho-pneumonia complicated by a mild diphtheria. During 90 days preceding immunisation, under practically the same conditions, it may be said that more than 225 cases of diphtheria occurred. By the use of antitoxine,

it has been possible to stamp out completely diphtheria in four great institutions for the care of children, in which it was prevailing in more or less epidemic form. In no instance has there been, so far as can be determined, any serious results from the administration of the remedy for this purpose. The duration of immunity, in many cases, is apparently not more than 30 days, but it may be for a much longer time. The doses required, to confer immunity, are probably between 50 and 300 antitoxine units according to the age of the individual treated.

#### CONCLUSION.

Diphtheria antitoxine has a distinct curative effect in diphtheria.

The results are very striking when the injections are used early in the disease, and when the diphtheria is uncomplicated with pneumonia or sepsis. In well-developed cases, and in those having complications, its benefit is less marked. In cases already profoundly under the influence of the diphtheria toxine, and in a dying condition, it is useless.

The total amount, required in the treatment of a case, varies from 1,000 to 4,000 units Behring's standard, and is determined by the severity and duration of the disease, and the weight of the patient.

An injection of 100 to 200 units of antitoxine in a person will give an almost certain immunity from diphtheria for four weeks.

If security is desired for a longer period, the injection must be repeated. Diphtheria antitoxine will not cure all cases of diphtheria, even if given early in the disease. It does not destroy the diphtheria bacilli. It is desirable, therefore, with the antitoxine, to use other treatment, both local and constitutional. The injection of diphtheria antitoxine, with its accompanying horse serum, is accomplished in a moderate percentage of the cases with disagreeable results, but in very few with any serious ones. No cases, uncomplicated with scarlet fever, have been observed in which the

kidneys showed any evidence of being seriously affected. It does not appear to have any deleterious effects on the blood, other than to cause a moderate temporary diminution in the number of red blood cells, and even this is more than counter-balanced by its lessening the action of the diphtheria poison. Large injections, in persons not having diphtheria, are more apt to cause unpleasant, and even somewhat serious, after effects than in those affected by the disease. It is well, therefore, to be fairly sure of the diagnosis, in adults where but little danger exists, before giving a full injection.

### DISCUSSION.

DR. THORNTON, of Erie county, said that no mention had been made in the paper of the recurrence of the pseudo-membrane after it had entirely disappeared from the throat. He had noticed this recurrence in several of his own cases, and he would like to hear further regarding the extension of the membrane, after the injection had been given, and before there had been time for the development of its systemic effect. In his own observations, he had noticed a considerable extension, immediately after the injection, although the membrane disappeared after about forty-eight hours.

DR. DIDAMA said that almost all of the objections to the treatment had been answered. It had been stated that the recent statistics were better. Was it that the cases had been brought for treatment at a much earlier period than formerly? Formerly it had been the rule to keep the children home until they were nearly dead; now, they were brought under observation very promptly, and before they were seriously ill. He had noted, in some of the statistical reports, that the cases coming to the hospital moribund had been excluded, in spite of the fact that they had been counted in the days past. Regarding the question of immunisation, he said it should be remembered that we often used to see one child very ill with diphtheria, and yet no other case would develop in that family. These points should not be forgotten in endeavouring to estimate the true value of the new treatment.

DR. E. D. FERGUSON, of Rensselaer county, asked as to the source of the supply of serum now used.

DR. PARK, in closing the discussion, said that he had frequently noticed after the membrane had once disappeared that there would

be a slight recurrence after a few days. This would speedily disappear after another injection. In a very few cases, diphtheria had developed about one month afterward. But such cases had been reported before the introduction of the antitoxine. He had not usually seen the cases for at least twelve hours after the injection, so that he could not say how commonly an increase was observed after the injection. He had only noticed it in two cases. In the statistics of the Willard Parker hospital, that he had used, he had included all moribund cases. The criticism made regarding the frequency with which only one case of diphtheria would be observed in a family was a very just one; it was to offset such a criticism that he had called especial attention to the results obtained with the immunisation serum in the institutions where large numbers were exposed. The antitoxine used at present in New York city was that supplied from the health department plant. The board of health supplied it free to the poor, the only condition being that a short report of the case be forwarded to the department. He had not observed any difference in the frequency or severity of the post-diphtheritic paralysis, since the introduction of the new treatment. This seemed to depend chiefly upon the severity of the individual case.

## ADDRESS IN MEDICINE—THE PRACTISE OF MEDICINE IN THE LIGHT OF BAC- TERIOLOGICAL RESEARCHES.

By A. ALEXANDER SMITH, M. D., of New York County.

*October 15, 1895.*

The scientific and accurate demonstration of the relationship of micro-organisms to disease is of comparatively recent date. Although prior to 1882 a large number of observations had been published in the attempt to establish the relationship of cause and effect between microbes and disease, the medical profession was slow to accept the conclusions. Koch's researches, published in 1882, marked a long step in advance. His method was the first exact one, and by its aid he was able to discover many new points in the morphology and biology of micro-organisms. His method, an account of which was published at that time (1882), has been very little modified to the present day, and "Koch's law," to the postulates of which a micro-organism must conform before it can be considered the cause of a certain disease, is still the authority. Scientific men had been prepared by the labours of earlier investigators to accept Koch's conclusions. Indeed, it is doubtful if, without such earlier investigations, Koch's conclusions would have been so readily accepted. Koch's investigations demonstrated the relationship of a specific micro-organism to disease, first by showing the constant presence of such micro-organism in the tissues or fluids of the individual suffering from such disease; then its absence in all other diseases; then its isolation, growth, and repeated cultivation, and finally its power of reproducing that disease after inoculation in certain animals.

The pioneer worker in modern bacteriology was Colm, pro-



fessor of botany in Breslau. He had students but no systematic course. Koch was probably the first to give a systematic course; this was given in Berlin in 1880 and 1881, but was not open to all applicants, being under governmental control. The first open courses were given in Munich, by Frobenius, and in Göttingen, by Flügge, in 1883 and 1884. Dr. Welch, now of the Johns Hopkins Hospital, took these courses, and in 1886 and 1887 gave, in the Pathological Institute of the Johns Hopkins Hospital, the first open course in instruction in bacteriology in the United States. This was modeled after Koch's course. In the spring of 1885, Dr. Herman Biggs gave instruction in bacteriology in the Carnegie Laboratory in this city, he having taken instruction in the winter of 1884 and 1885 from Müller, a director in the Dental Institute of the University of Berlin. In the last ten years courses of instruction have been established in many places in Europe and this country, and medical students are given the opportunity for instruction in this important branch of medical study. In this country, recently, laboratories have been established in connection with boards of health, local and state, for the prosecution of bacteriological work.

It may prove not uninteresting to glance at the work of the past.

Leuwenhoeck first observed micro-organisms in 1675.

Pleuciz, a contemporary of Leuwenhoeck, was the first to advance the idea that micro-organisms are the cause of disease, and that each disease has its specific organism, transmitted through the air. He was unsparingly ridiculed, however.

Müller, in 1773, was the first to make any close study of micro-organisms; he first classified them (yeasts, fungi, etc.).

Davaine, in 1863, first demonstrated the probable relation of a specific organism to a specific disease.

Rindfleisch, in 1866, first demonstrated the presence of micro-organisms in pathological lesions.

Pasteur may be said to have been the first to thoroughly study micro-organisms. He was originally a chemist, but noticing one day that certain solutions of the tartrates, after standing, underwent changes in their polarising properties, he investigated the subject, and thus started on his life's work, the results of which have been so wonderful and valuable. In 1857, he published his investigations of the lactic-acid fermentation, following this up with his work on the diseases of vines, beer, etc. He proved each fermentation to be due to a certain organism, and that if its entrance be prevented, fermentation could not take place. While his early work does not come directly into the field of medicine, it influenced it greatly. The process which destroyed grapevines, was a true disease; he considered it as such, and after determining its aetiology, pointed out a mode of cure. His later work on anthrax, gangrenous septicaemia, and supuration, brought him directly into human medicine. The value of his work is inestimable. Our ideas of sterilisation are based on his work, and he first succeeded in isolating an organism by means of his method of "successive cultures." Koch's solid media method is simply an advance on the same line. Pasteur first stated that micro-organisms are absolutely essential to life on the globe, that they occupy a middle position between the animal and higher vegetable kingdom, and by decomposing animal matter into its component elements, render it available as food for the plant world, which in turn supplies the animal world with food and oxygen. In a word, he demonstrated the fallacy of "spontaneous generation."

Lemaire discovered the value of carbolic acid as an antiseptic, and believing suppurations of wounds to be due to germs from the air, he treated such wounds with carbolic acid. This was the first step toward the antiseptic treatment of wounds which Lister worked out to such brilliant results afterward.

Villemin, in 1865, first demonstrated the infectious nature of tuberculosis, by showing that it could be transmitted to animals by inoculation.

In the early half of this century it was enough to say that a disease was due to inflammation of a particular organ or organs, and that such inflammation could be caused by cold, sudden changes, and so on. The contagious and epidemic nature of the various acute diseases was well recognised. Thirty years ago the spread of such diseases was thought to be through the air. Cholera and typhoid fever alone were thought by many to be transmitted by means of drinking-water or food. We now know that transmission through the air plays a very minor rôle, at least in those diseases in which the micro-organism has been demonstrated. It has been proven that solid particles of matter, such as micro-organisms, do not rise from moist surfaces. Bacteria are mainly diffused by adhesion to the hands, to clothing, etc., or by drying up, when they take the form of dust and are blown about. How easy to demonstrate from this the great value of prophylactic measures. It is comparatively easy to destroy the vitality of micro-organisms in the moist state, as in typhoid-fever stools, for example, and correspondingly difficult where they are all around us in the atmosphere in the form of infected dust.

The changes brought about by our present knowledge of bacteria are more marked in surgery than in internal medicine. The discovery of the organisms of suppuration, of the effects produced upon them by bichloride of mercury, carbolic acid, and other substances, and the demonstration that an operator can go almost anywhere in the body so long as he keeps everything clean and aseptic—these facts have revolutionised surgery and obstetrics. We no longer hear that a wound is “suppurating nicely,” but if it does suppurate the surgeon wants to know the reason, whether it is his fault or that of his assistants. There is blame somewhere.

In obstetrics, if proper precautions are taken, the many dangers from sepsis, which formerly surrounded the patient, have been reduced to the minimum. In internal medicine, on the other hand, there has been no such marked progress.

While the discovery of the bacterial nature of certain diseases has been of great value in prophylaxis, and has demonstrated the futility of certain lines of treatment, no material advance has been made in the actual treatment of disease by internal medication. Exception may be made in the case of diphtheria, which will be discussed later. This is chiefly due to the fact that in diseases we do not find the specific organisms localised in limited and accessible areas. Where surfaces are accessible, such as the skin and mucous membranes, and cavities like the pleural and peritoneal cavity, specific local treatment based on the knowledge of the microbe origin of many diseases affecting them, has been of great practical utility. We have not yet found an agent which, if given internally, will surely and rapidly kill the micro-organisms, and not at the same time kill or injure the living tissues of the body. Antiseptic and aseptic methods are, for this reason, only beginning to be employed in internal medicine. The tendency now is to prevention of the spread of the disease by individual prophylaxis. The application of the various methods can only be thoroughly and effectively carried out when the physician understands the reasons for his actions, keeping clearly in mind the objects to be attained. It is the practising physician to whom is intrusted the application of the discoveries and advances made by the laboratory workers; hence the importance of a familiarity with the theories and principles of bacteriology on the part of every physician. The present ideas as to the contagion and diffusion of disease have been extended to other diseases, the precise micro-organism of which we are as yet ignorant of; for example, scarlet fever, measles, small-pox, etc.

The study of the products of micro-organisms, the toxins, antitoxins, bacterio-proteins, toxalbumins, etc., has become most important. In the early bacteriological work it was thought the bacteria themselves were the direct cause of the manifestations of disease. It has now been proven, however, that these manifestations are due to the toxins produced by the bacteria. It is through the study of the action of these

substances that our modern ideas of immunity have been evolved. Many observers hold that it is by the artificial production of immunity that we shall be able to combat the infectious diseases in the future. There are three chief ways of producing it in man.

First, by producing a modified form of the disease (vaccination). Over a hundred years have elapsed since Jenner first applied in medicine the principles of immunity against disease, by employing vaccination as a protective means against small-pox. Neither he nor his immediate followers understood the principles of immunity as brought about by vaccination. His first observations, however, have stood the test of time, and clinical facts have only served to strengthen his position. It was reserved for the genius of Pasteur to make a satisfactory scientific demonstration of their truth by his eminently brilliant discoveries concerning the protective power of inoculation in animals and fowls. Pasteur's method of securing immunity depended essentially on submitting the individual or animal to the attack of the disease-producing organism itself in an attenuated form—at least in a form modified in such a way as to lessen its virulence. Soon, however, other methods were devised. These later methods of securing immunity do away with the necessity of any contact whatever between the individual and the bacteria themselves. One of these methods is by the introduction into the system of the bacterial poisons produced by the specific organisms, but without the bacteria.

The third chief method, the latest, is by the introduction into the system of the serum of an animal, which is either naturally or artificially immune to the disease in question. Koch, Chauveau, Buchner, and in later times Behring, Roux, and Kitasato, have done the most important work on this subject.

So far, the treatment of disease by injections of the toxic products or toxins of the specific micro-organisms has not been of marked value. It has been tried in tuberculosis (Koch's tuberculin), typhoid fever, and latterly in cancer,



by injection of the toxins of the micro-organism of erysipelas. Serum-therapy offers the most promising results, and in view of the wonderful effects of the antitoxine treatment of diphtheria we may look for a similar treatment in typhoid fever, lobar pneumonia, and cerebro-spinal meningitis; in fact in all the diseases produced by micro-organisms in which the micro-organisms themselves are the source or the cause of the production of the curative substances.

The very fact that recovery from infectious diseases is spontaneous, suggests that there is in such diseases a power on the part of the blood to produce an agent which is antagonistic to the toxins which have caused the manifestations of the disease; and after the toxins have been neutralised by such antitoxine, the remaining antitoxine affords such immunity as is generally observed. It has long been known that in many of the infectious diseases, one who has suffered one attack is usually immune against a subsequent attack.

Let us glance at some of the infectious diseases in detail, and trace the influence bacteriology has produced upon our views concerning them.

In lobar pneumonia early treatment was based upon the idea of its being an inflammation pure and simple. Bleeding and purging were resorted to; counter-irritation in its various forms was thought highly of. The necessity of stimulation was well recognised. Relief, as far as possible, of the main symptoms occupied an important place. The occurrence of pneumonia in so-called epidemic form was recognised by Lænnec.

The discovery of the bacillus by Friedländer in 1883, and that of the "*diplococcus pneumoniae*" by Fraenkel in 1886, while modifying and confirming some of the existing views, has had practically very little influence upon the treatment of the disease. Sternberg, in our own country, discovered this micro-organism in the saliva in 1880. Other bacilli than those named have been demonstrated as present in different forms of pneumonia, such as streptococci, staphylococci, tubercle bacilli, and influenza bacilli. The pneumonia due to the

diplococcus of Fraenkel is believed to be the one which runs the typical course of a lobar pneumonia, and constitutes about seventy-five per cent. of all cases. These pneumonias running an irregular course are explained by the bacteriologist on the ground of the presence and influence of one or more of the other bacteria named. It has been proven, too, that in a pneumonia due to the pneumococcus alone, the prognosis is more favourable than in the irregular forms alluded to. For some years prior to the discovery of these organisms the recognised treatment was an expectant and supporting one, and in the main is so still.

The only attempts that have been made to evolve a line of treatment from our knowledge of the pneumococcus were those of the brothers Klemperer. They believe that the pneumococcus produced an "anti-pneumotoxine" which, when present in sufficient quantity, put an end to the disease by crisis. They claimed to have isolated this substance, and the first results by its use were promising. Further investigation has not substantiated their claims. While pneumonia is occasionally contagious, it is of such rare occurrence that prophylaxis, even if we knew how to bring it about, would be superfluous. The pneumococcus being a very frequent inhabitant of the mouths of healthy individuals, it seems impossible to make use of any prophylactic measures other than avoidance of constitutional depression of any kind. The frequent association of otitis media, cerebral meningitis, pericarditis, and the occasional occurrence of endocarditis and peritonitis in the course of an attack of pneumonia, were formerly thought to be accidental accompaniments. Their occurrence is now explained by the presence in the exudate of the pneumococcus of one or more of the other organisms named.

The cholera spirillum, discovered by Koch in 1884, is generally admitted to be the specific organism present in the production of cholera. Our knowledge of this fact has had little effect on the actual treatment of the disease, unless the large tannin and water injections be considered an outcome of this knowledge. It was found by experiment that tannin was to

a certain extent antagonistic to the virulence of the cholera spirillum. Because of this fact and its known astringent effects it was suggested in the treatment of cholera.

The discovery of the specific organism has been of the greatest value in preventing the spread of the disease.

It is also possible to determine, by means of the proper bacteriological methods, at the beginning of an epidemic of some diarrhoeal disease, whether it is true cholera or not. In quarantine work this method of diagnosis is especially valuable, and leads at once to the use of proper precautions to prevent the spread of the disease. Work is now being done in Germany upon a cholera antitoxine, but the reports so far published are insufficient to warrant our forming any conclusion as to its value.

Tuberculosis has been one of the most thoroughly studied of diseases, and was generally ascribed to a micro-organism before Koch, in 1882, reported his discovery of the tubercle bacillus. The climatic and dietetic treatment of tuberculosis cannot be said to have been advanced by this discovery. On the other hand, in diagnosis, prognosis, and prevention of the spread of the disease, it has been of the utmost service. The demonstration of the presence of the bacillus in the sputum, the stools, the urine, the secretions from sinuses—indeed its presence in many situations—have often made definite a suspected diagnosis. It has shown that at least many of the so-called scrofulous conditions are tuberculous. While the communicability of tuberculosis was recognised long before 1882 by clinical observation, the discovery of the bacillus and subsequent researches served to emphasise the fact that tuberculosis must be placed among the infectious communicable diseases, and that communicability must be recognised under certain conditions. Since the discovery of the bacillus the modes of infection by it have been more definitely demonstrated. Our views of heredity in regard to tuberculosis have been greatly modified. The disease was formerly thought to be directly transmitted from parent to child. Now it is believed to be transmitted very rarely, and that

only by the mother. Heredity does play an important rôle in many cases, in that it transmits a soil ready for the reception, growth, and development of the specific germ when this is implanted.

The importance of infection by inhalation was recognised early after the discovery of the bacillus. It led quickly to the thorough sterilisation of the moist sputum. The sputum is found to contain the virus in large quantity, and when dried takes the form of dust and disseminates everywhere. It has been demonstrated that the dust of rooms and wards of hospitals which have been occupied by tuberculous patients is in many instances infective. Any condition under which the dust infected with tuberculous virus can be inhaled may be the means of infection. The importance of this fact cannot be too highly emphasised in the direction of the prevention of the spread of the disease. Direct intimate contact may communicate the disease. It may be communicated by inoculation, but it then usually remains localised. Milk may be the means of infection. We are all constantly exposed to the infection from the presence of millions of the micro-organisms in the air we breathe at times. Some of us escape because of the fortunate lack of vulnerability of our tissues. All possible means should be resorted to for the prevention of infection. Koch's tuberculin has been a disappointment. It still, however, retains the confidence of a few observers in a modified form, but is now mainly used in the diagnosis of tuberculosis in cattle.

It is generally believed that the bacillus discovered by Eberth in 1880 is the cause of typhoid fever. Based upon this discovery efforts have been made to introduce methods of treatment directed toward the destruction of the bacilli or their toxic productions, but without definite success. It is only in prophylaxis and in the prevention of the spread of the disease that this discovery has had any great effect upon internal medicine. It has confirmed the belief, held by many before its discovery, that milk and water and food are the chief modes of infection. In many instances the bacteriolo-

gist has been able to definitely trace the source of an epidemic of typhoid fever by discovering the bacillus in the water-supply. The typhoid bacillus has wonderful vitality. The bacteriologist has demonstrated that it is capable of withstanding for a brief period a dry temperature of 194° F., but if exposed to a moist heat at a temperature of 140° F. for twenty minutes its vitality is destroyed. Enclosed in a block of ice at a temperature considerably below freezing-point, it maintains its vitality for months, but if the water in which it is contained be alternately frozen and thawed five times a day its vitality is destroyed in three days. I only name these among the many points illustrating its vitality.

The Germans have lately tried treating typhoid with sterilised cultures of the typhoid bacillus grown in thymus bouillon. The results at first were promising, but subsequent trials have been far from satisfactory.

Tetanus was first shown to be infectious and the bacillus isolated in 1884. Soon after Nicolaier demonstrated the presence of the same bacillus in various kinds of soil, and inoculation of animals with the soil containing these bacilli produced tetanus.

It is interesting to note the extraordinary virulence of tetanus toxine, it being from two hundred to four hundred times as virulent as strychnine. Immunity to tetanus has been procured by inoculating an animal with the blood-serum of another which has had the disease. An antitoxine prepared from the blood-serum of immunised animals has been used and reported as successful. The testimony in regard to the results is conflicting and the treatment by this method is still on trial. Perhaps with improved methods of preparation of the antitoxine, and a better knowledge of the quantity required in any given case, better results may be obtained.

The greatest influence exerted over internal medicine by bacteriology has been in connection with diphtheria. The profession has been slow in accepting the view that the bacillus discovered by Löffler in 1884 is the cause of diphtheria,



and there are still many who disbelieve it. The prevailing opinion now is, however, that this bacillus is the cause of true diphtheria. The first effect of the discovery was the abolition of certain useless lines of treatment, and the recommendation of others. Constitutional and local treatments were not displaced by this discovery, nor are they now. The greatest change in treatment brought about by the discovery at first was the more persistent and intelligent use of local treatment. The next step was the recognition of bacteriological methods and results in diagnosis, many believing the presence of the Löffler bacillus the only positive criterion of diagnosis. Diphtheria had long been recognised as highly contagious. The discovery of the specific organism but served to emphasise that fact. It is now possible to find out how long the micro-organisms remain in the throat and nasal passages after the patient is apparently cured, and how long it is necessary to resort to quarantine.

One very important feature has been the demonstration that many of the milder forms of inflammation of the mucous membrane of the throat and nasal passages are diphtheria and are capable of communicating the disease. It has recently been shown that this bacillus is not infrequently found on the mucous membranes of the throat and nasal passages of persons otherwise apparently well. This is true, too, of other bacilli in this and other situations. The mere presence of a bacillus of any kind is not sufficient to account for the manifestations of the disease of which such bacillus is the specific cause. Some additional factor seems necessary,—some agency causing such bacillus to show its pathogenic activity.

As to the final and greatest steps in advance, the results of the researches of Löffler, Behring, Aronson, Roux, and others, "the antitoxine treatment of diphtheria," it has been the foremost subject in the medical world the past year. It has had, and still has, its opponents, some claiming the serum acts harmfully on the kidneys; others, that it causes destruction of the blood-corpuscles, enfeebles the heart's action, and favours the occurrence of paralysis. All these objections have

been met and contradicted. Even admitting there are possibilities of occasional deleterious effects, the wonderful beneficial results many times out-weigh the possible harm.

The first publication demonstrating the principles of serum-therapy were made in 1890. In the autumn of 1891, the first trial of serum-therapy in human diphtheria was made. The first attempts were with a weak serum and insufficient doses. From time to time articles on the subject appeared up to August, 1894, when the serum prepared at Höcht was placed on sale.

Roux's address at Budapest, in September, 1894, aroused the attention of the whole medical world to the possibilities of the serum-therapy of diphtheria. During the past year it is estimated that 100,000 injections will fall far below the number. It needs no argument now to establish its value. The testimony is overwhelmingly in its favour as a curative agent. From all sources in Europe and this country comes the clinical evidence of its power. It has reduced the mortality enormously. Not only have its wonderful effects been shown on the disease when established, but its power of securing immunity to those who have been exposed to the contagion is marked.

The results of serum-therapy in diphtheria being so favourable, the field for work of like character in connection with other infectious diseases is almost without limit. The outlook for the future is most promising. Bacteriological researches of a most important kind have been made in connection with veterinary medicine. Of interest to us as physicians is particularly the work in connection with such diseases as can be communicated to man. I need only mention them here. Hydrophobia, anthrax, actinomycosis, glanders, and we may include tuberculosis in this group. To name hydrophobia without associating with it Pasteur's name would be a neglect of recognition of eminent scientific work. It was his investigations in connection with this disease which may be said to have led up, in part at least, to the study of immunity by means of serum-therapy.

Bacteriological researches have made clear many points in the aetiology of diseases which before were obscure. It offers a satisfactory scientific explanation of the communicability of certain diseases. It has made diagnosis more definite, and in some instances aided in diagnosis which was impossible by any other method. It has led to more accurate prognosis. It has explained complications which before were considered accidental occurrences. It has revolutionised surgical and obstetrical practise. It has made it possible by intelligent sanitary surveillance to restrict and prevent the spread of dangerous epidemics. It has led up to the specific treatment of diphtheria (and possibly tetanus), and to conferring immunity for a longer or shorter period to those exposed to it.

A recognition of these conclusions brings the bacteriologist and clinician into most intimate relationship, each one as a necessary aid to the work of the other. The results of the work of the laboratory must be confirmed by the careful, conservative tests of the clinician. By their combined work only can the results of laboratory investigations be made of widespread practical benefit.

## A CASE OF EXTRA-UTERINE PREGNANCY.— DEATH OF THE FOETUS.—UNUSUAL COMPLICATIONS.

By GEORGE E. McDONALD, M. D., of Schenectady County.

*October 16, 1895.*

Mrs. S., of German parentage, twenty-six years of age, of exceptionally fine physique, with red lips and rosy cheeks, married at the age of twenty, the mother of a boy four years old, came to my office, August 31, 1894, stating she had missed two menstrual periods and was nearing the third; believed herself pregnant; was glad of it, and wished me to prescribe for a slight uneasiness in the epigastric region.

A vaginal examination disclosed a slightly enlarged uterus, with the os closed and lips soft. She told me she had had a miscarriage two years before, at which time she was two months gone.

On the night of September 1, I was hurriedly summoned to her house. She then complained of excruciating pain in the epigastrium, paroxysmal in character, which increased on pressure. She had vomited before my arrival, and was nauseated still. Pulse normal and temperature not elevated. I administered morphia hypodermatically, and ordered hot applications to painful part.

On the following morning I saw her again, when I found the pain had disappeared soon after my departure. She was bright and cheerful, with still no elevation of temperature and pulse normal.

During the following five or six days she had at times pain of like character in the epigastrium, radiating to the right, over the liver, and occasionally extending to the right shoulder. After the administration of large doses of sweet

oil, ten or twelve gall-stones were discovered in the faecal movement.

On the 14th of the month she became apparently well, and I left the city, remaining away thirteen days.

On the day of my return I called upon her, and to my amazement and disgust I learned a homoeopath had made three visits to her, in spite of my advice to send for Dr. H. C. Van Zandt, in case she needed a physician during my absence. I was also mad—too mad even to swear. My feelings were somewhat mollified, however, when I was told he had treated her for piles, and piles alone. A luminous example of the usual diagnostic skill of the practitioners of that humbuggery! A conflict between a dunderhead, lunk-head, leatherhead, an ass and a fundament—the fundament being the wiser, as the so-called skilfully applied remedies had been of no benefit. More appropriately this homoeopath's surname begins with an S.

At this time she showed some symptoms of anaemia, and a small tumor could be discovered just to the right of the uterus. A vaginal examination showed the womb to be retroverted, the fundus pressed low down in the vagina, with the os high up under the pubes.

I was told during my absence a bloody vaginal discharge had appeared, and in a few days she passed a piece of the decidua about  $1\frac{1}{2}$  inch long by  $\frac{1}{4}$  inch thick. The temperature was elevated to  $103^{\circ}$  and pulse quickened to 120. Her abdomen was also tympanitic in a moderate degree. The skin and conjunctiva assumed an icterode hue. Soon after this a cough appeared, paroxysmal in character, unattended with expectoration, and in the course of a few days, after a severe attack of coughing, she expectorated a large quantity of pus, which her husband said was about three quarts.

Liver débris now appeared in the expectorated matter, and oedema of the legs was noticed, the right leg being more oedematous than the left. With the exception of a diarrhoea of a few days duration her bowels were regular.

December 18 she began to improve in health; the cough



and expectoration lessened; the oedema disappeared, and her abdomen began to lessen in size.

February 5, 1895, I was again absent for two weeks, and during this time she was attended by a regular practitioner.

On my return I found that she had continued to improve, and on April 19 I made my last call.

I made a social call upon her one day in June, when she told me she was well; was doing all her housework, except washing, and wanted to do that, but her husband objected. She said she had ridden thirty-two miles one day in a wagon, with no apparent harm to herself.

Upon vaginal examination the womb was found in normal position; the abdomen was flat, and no tumor could be felt; she had regained her flesh, and unusual fine colour.

July 19 I was requested to see her again, and at that time she complained of the old epigastric pain, which she thought had been caused by eating baked beans, cherries, and berry pie, of which she had eaten very freely the night before.

Excessive irritability of stomach also reappeared, and the vomitus soon partook of a paris-green colour; obstruction of bowels was present; the pulse quickened; temperature increased; the abdomen became somewhat distended, and a well-marked attack of acute peritonitis was ushered in.

Saline cathartics were given, with no avail, and morphia was freely administered hypodermatically.

July 30 Dr. E. D. Ferguson, of Troy, was called in consultation. The case was now hopeless; she expired August 1, 6 a. m.

At 4 p. m. same day an autopsy was made by Dr. Van Zandt and myself.

The usual incision was made in the median line from top of sternum to pubes.

The abdominal cavity was empty, because the undertaker had inserted his trocar and drawn off its contents. The parietal peritoneum was as black as ink; the intestines were adherent to right side of pelvis. The calibre of the intestines was not lessened in size.

The liver was enlarged, and on the under surface of the larger lobe, rather nearer its posterior border, there were seven slit-like openings ranging in size from one half to one and one half inches in length with edges inverted.

The finger introduced entered small abscess cavities; the upper surface of this lobe, close to its junction with the smaller lobe, was adherent to the diaphragm, and the diaphragm to the right lung. The sinus, through which the abscess matter had passed to the right bronchial tube, had become obliterated, and a fibrous tract was all that remained.

The lungs were healthy, and of a beautiful pink colour.

In the right broad ligament, about one and one half inches from the uterus, a sac with thick walls was found, tightly enclosing foetal bones. (Bones exhibited.)

This extremely interesting case was, after a few visits had been made, correctly diagnosticated as due to the passage of gall-stones, complicated with acute hepatitis, with abscess resulting, which was making an attempt to find egress through the lungs.

The extra-uterine pregnancy was of course easily diagnosticated after the expulsion of the decidua.

That this woman was practically well from the first attack of abscess of liver and extra-uterine pregnancy will be conceded, I think, from the fact she was able to resume her domestic duties with entire freedom from pain, regained her colour and flesh, had ceased to cough, and all abdominal enlargement had disappeared.

It will also be conceded, I think, that the foetal bones found on autopsy were productive of no harm, and consequently were not a possible factor in the fatal issue.

In my opinion, had not this patient been imprudent in her diet she would not have suffered a second attack of hepatitis, abscess of liver, and subsequently of peritonitis.

This article is entirely written from memory, and while some details are omitted the main facts are given.

DISCUSSION.

DR. E. D. FERGUSON said that the attending physician should be complimented upon the correctness of the diagnosis made in this case, for when he saw it, Dr. McDonald had told him that there had been an acute hepatitis—an abscess of the liver—which had opened into the bronchi, and an extra-uterine pregnancy complicating these conditions. At the time he had seen the case in consultation, it had been possible only to diagnosticate a peritonitis. The fact that the diagnosis of all these extraordinary conditions had been confirmed by autopsy was quite remarkable.

## THE HEART IN ANAEMIA.

By DELANCEY ROCHESTER, M. D., of Erie County.

*Read by title, October 17, 1895.*

I have chosen as my subject "The Heart in Anaemia" because I believe that not infrequently, through the mismanagement of anaemic cases, organic deformity of the heart occurs, and, on the other hand, that sometimes the presence of an anaemic bruit has given rise to diagnosis of organic deformity and consequent false prognosis.

Let us consider then briefly the symptoms of anaemia referable to the heart, the signs to be found by physical examination, the condition of the heart as revealed by autopsy in cases of pernicious anaemia and in some of the severe secondary anaemias, and then let us see if we can fit the two together in such a way as to obtain a rational explanation of the symptoms and signs and to formulate methods of treatment suitable to the conditions revealed by careful study of the case.

The symptoms of anaemia referable to the heart may be said to be shortness of breath, palpitation, and pain in the praecordial region upon physical exertion or emotional excitement of any sort. All of these symptoms may be present in a given case, singly or together, at different periods in its history. When we make a physical examination of an anaemic patient we generally note upon inspection a marked pulsation in the epigastrium and praecordium, often *more* marked in the epigastrium; the apex beat is generally in its normal position, or occasionally a little below and to the left; percussion gives a normal area of cardiac dullness, or one slightly increased transversely; auscultation reveals a forceful beat of the apex against the chest wall, a first sound, short in duration and lacking the

normal booming quality, accompanied by a loud, soft-blowing murmur; sometimes there is no first sound at all, its place being entirely taken by the murmur; the second sound is sharp and valvular in quality, the pulmonary being considerably accentuated as compared to the aortic.

With the exception of Laennec, Guttman, and in one case Strümpell, all observers whose works I have been able to consult agree that the anaemic-heart murmur is systolic in time, and the majority of these observers agree that it is basic in situation. According to different observers, the point where this murmur is heard with greatest intensity is over the pulmonary orifice,—*i. e.*, in the second left intercostal space close to the sternum; over the aortic orifice, *i. e.*, in the second right intercostal space close to the sternum; at the apex of the heart; in the tricuspid area. In fact, as Roberts says, it “has usually the position of a pulmonary systolic murmur; . . . it may, however, be situated over the aorta or be heard at all the orifices.”

Balfour, of Edinburgh, agrees with other observers that the anaemic-heart murmur is systolic in time and basic in situation, but places its point of greatest intensity, not over the aortic or pulmonary orifice, “but” (I quote from his book) “actually about one inch and a half, or rather more to the left of the pulmonary area, and in the same plane immediately over the part where the appendix of the left auricle pops up from behind just to the left of the pulmonary artery.”

Another clinical observation, originally made by Hanford I believe, is worthy of note, namely, that in the large majority of cases where the murmur is basic in situation, its intensity is much greater when the patient lies flat on the back than when in the upright position; indeed, that in some cases the murmur is audible only when the patient lies down, disappearing entirely when the upright position is again assumed. So much for the symptoms and signs of anaemia that may be referred directly to the heart as their source.

Let us now turn our attention to the morbid anatomy of



the heart in such cases. False conclusions are apt to be drawn from too small a number of observations, therefore as I have seen but one autopsy in a case of pernicious anaemia, and that not in my own practise, my personal experience is of no value in the matter. In this case, however, there was fatty degeneration of the myocardium with dilation of the left ventricle.

In his masterly article on diseases of the blood, in the "American Text-book of Theory and Practise of Medicine," Osler says, in regard to the morbid anatomy of the heart in leukaemia,—“The serous membranes (peri- and endocardial) not infrequently present ecchymoses, and leukaemic new growths may exist there as well as on the peritoneum. The cavities of the heart are, as a rule, dilated and the myocardium soft; if the papillary muscles be teased out, a moderate grade of fatty change is evident.”

The changes in the heart in progressive, pernicious anaemia are stated by the same author as follows: “The heart muscle is very pale, light yellow in colour, and shows in fresh-teased preparations the most intense fatty degeneration. The walls of the ventricles are remarkably lax and flaccid and the cavities contain light-coloured blood.”

The same author says, in regard to the morbid anatomy of chlorosis,—“Few cases die directly from the disease, and the pathological findings in those which have come to autopsy have been by no means constant.” Rokitansky, in 1846, pointed out certain instances of incurable chlorosis due to anomalies of the blood vessels and genital organs. Virchow described a congenital hypoplasia of the vascular system found in several autopsies on chlorotic patients. “The aorta and all its branches were of small calibre and thinner than normal; the elasticity of the vessels, however, appeared to be increased. . . . The heart is at times dilated and the left ventricle hypertrophied.”

I will not quote others, as they all agree essentially, and the quotations given represent the latest and best observations on the subject.

To sum up, then, we may say that we have in the heart, according to the degree and character of the anaemia, the following morbid conditions present: Laxness and flaccidity of the myocardium, with some dilation of the cavities and some hypertrophy of the left ventricle; fatty degeneration, varying from a mild degree of degeneration of some of the fibres of the musculæ papillares to the severe grade of degeneration seen in progressive, pernicious anaemia.

The shortness of breath, the palpitation, the pain, the increased area of cardiac dulness, and the murmurs are the symptoms and signs that it behooves us to explain from our pathological findings. The first four are easy of explanation, and there is essentially no difference of opinion among observers in regard to them. The shortness of breath and the palpitation are both due to the effort on the part of nature to supply sufficient oxygen to the organism by increasing the rapidity of the stream, which is so poor, in the oxygen carrier, haemoglobin; the pain is probably the cry of starved nerve for more or better food; the slight increase in area of cardiac dulness observed in some cases is undoubtedly due to the mild degree of dilatation and hypertrophy that has been observed.

The most interesting point, and the one about which there is more difference of opinion among competent observers, is the mode of production—the mechanism—of the anaemic murmurs.

When fluid is driven with a certain amount of velocity through a constricted opening into a larger space beyond, a sound is produced, which has been shown by careful experiments to depend upon the vibrations of what have been termed fluid veins, produced at a greater or less distance from the orifice, according to its size and the velocity with which the fluid is propelled. In the case of heart murmurs dependent upon organic lesions of the valves, whether the murmur is direct or regurgitant, the sound is produced in this way, the blood being propelled with a certain velocity through a constricted opening into a larger space beyond.

The sonorous vibrations of these fluid veins are transmitted to the surrounding blood, to the walls of the containing vessels, and thence, through whatever medium may intervene, to the ear of the listener. This is, beyond doubt, the true explanation of the mechanism of the heart murmurs dependent upon valvular disease.

We have seen that by different competent observers the cardiac murmurs of anaemia have been located at the aortic, the pulmonary, the mitral, and the tricuspid areas, and in the area described by Balfour, in the second left intercostal space to the left of the pulmonary area; that for the most part these murmurs have been systolic in time, though a few diastolic murmurs have been described. Is there any rational manner in which we can explain the production of these murmurs which will satisfy all of these observations, for we obviously have no right to doubt the diagnostic power of any observer unless we have proof of the inaccuracy of his observations?

First, then, how is this murmur produced at the aortic orifice? In a healthy individual, by the ventricular systole a certain amount of blood of a definite weight is driven with definite velocity against the semilunar valves, pressing them flat against the walls of the artery. Evidently if the weight of the blood is reduced below a certain limit, though the velocity remain the same or even be slightly increased, the semilunar valves will hang out into the lumen of the vessel, and thus produce a constricted opening with a larger space—the cavity of the artery beyond; all that is needed to produce the fluid veins of Savant and the consequent sonorous vibrations resulting in the murmur.

A similar line of reasoning would apply to the production of the murmur at the pulmonary orifice. Before leaving the base of the heart, we have the observation of Hanford, which has been confirmed by us all, that in a certain number of cases the basic murmur is increased in intensity when the patient lies down. Hanford's own explanation is, that when the patient lies down, owing to the lax and flabby condition

of its walls, the whole heart falls upward and presses upon the larger vessels, thus producing a constriction and the necessary mechanical condition for the production of a murmur; that when the patient assumes the upright position, the heart drops down again, and the murmur disappears, or only so much remains as may be due to the obstruction produced by the hanging out of the valves, as I have suggested. Personally I am not quite satisfied with this explanation of Hanford's, but I have not as yet anything more rational to offer in its place.

Now, how about the murmurs heard at the mitral and tricuspid areas? As they are systolic in time, they must be regurgitant in character.

We have learned, that, in the morbid anatomy of anaemia, there is a lax and flaccid condition of the muscular fibres, and often some fatty degeneration; that when there is fatty degeneration it is more marked in the musculæ papillares to which the chordæ tendiniae are attached, and is not infrequently limited to those structures. We have found that with this laxness and flaccidity of the walls, there is developed a certain amount of dilatation of the cavities, producing a dilatation of the auriculo-ventricular orifices, and a consequent insufficiency of the valves, resulting in regurgitation. This is the explanation given by Dr. Balfour of the mitral regurgitation observed by him. This would require a considerable dilatation of the ventricle, more than we have any right to premise from the size of the heart as shown by percussion. Another and, to me, more rational method of explaining this regurgitation—one long ago brought forward by Walshe, of Dublin,—is through the fatty degeneration and consequent weakening of the musculæ papillares to such an extent as to allow the auriculo-ventricular valves to yield to the pressure of the blood during the ventricular systole, and allow the regurgitation to take place. As for the murmur heard in the area described by Balfour, you will remember that he says it is “about one inch and a half, or rather more, to the left

of the pulmonary area, and in the same plane immediately over the part where the appendix of the left auricle pops up from behind just to the left of the pulmonary area." It is a well-known fact, that sometimes a mitral regurgitant murmur is heard with greatest distinctiveness at this point, the sound being conducted better "along the course of the regurgitating blood, the fluid veins producing sonorous vibrations, louder at the point of impingement than at that of origin." From these observations he concludes that the heart murmur of anaemia is one of mitral regurgitation. We have just shown how mitral regurgitation may occur in anaemia,—thus the murmur heard in Balfour's area is accounted for.

In those rare cases, such as Strumpell's case of pernicious anaemia, where a diastolic murmur occurs, the dilatation of the ventricle has probably proceeded so far as to dilate the aortic orifice, and so allow regurgitation to take place at that point.

Thus, we see we have a rational explanation of the modes of production of anaemic heart murmur which is applicable to all cases, and is none other than that which holds in the case of organic murmurs, namely, an obstruction to the onflow of the blood, causing at one point a narrowing of the lumen of the vessel through which it passes, thus producing the fluid veins already referred to.

The arterial murmur heard in the carotids in a certain number of cases is synchronous with the cardiac systole, and is, in my opinion, merely a transmission along the current of the blood of the cardiac murmur arising at the aortic orifice.

The venous murmur, however, is a continuous humming sound, and so can not be referred for its origin to the cardiac murmur which is necessarily intermittent, as it occurs only with the systole.

It must, therefore, originate in the vein itself, and here we find a cause for it. The external jugular vein is attached to the clavicle, the lower part of the vein, being thus kept constantly extended, not being able to collapse down upon the



blood; just above this somewhat enlarged chamber of the vein is a pair of valves; owing to the relaxed condition of the walls of the vein found in anaemic individuals and the lack of weight of the blood necessary to keep them in place, it is highly probable that these valves hang out into the lumen of the vessel, and produce the necessary obstruction for the formation of the fluid vein of Savant and their sonorous vibrations. The continuousness of the sound is probably due to the fact that the velocity of the blood current is much more constant, though not so great, as in the arteries.

To sum up, we have the following facts before us: First, that when fluid is forced at a certain velocity through a constricted opening into a larger space beyond, at a certain distance from the orifice, its particles are thrown into sonorous vibrations; second, that in certain diseased states of the cardiac valves, we have, beyond a doubt, the necessary conditions for the production of such sound, and the presence of the sound; third, that when there is no such diseased state of the valves, but when, from the impoverished state of the blood and certain changes in the myocardium, we should expect the healthy valves to be placed in such a position as to produce the before mentioned constriction, we find the murmur, the indication that such constriction exists, present; therefore, I think we are justified in concluding that the valves are in that position, especially as the murmur can be satisfactorily accounted for in no other manner. What practical conclusions as to the management of our cases can we draw from the facts before us?

I think we are justified in the following: If the murmur is heard only at the aortic or pulmonary orifice, and is systolic in time, it is probable that the condition of the blood is the chief factor in its production, and that the cardiac muscle is still in fair shape; if, however, the pulmonary second sound is considerably accentuated as compared to the aortic, there is probably already some change produced in the myocardium of a degenerative character; if the murmur is heard with greatest intensity at the apex, or in Balfour's area, or

over the tricuspid valve, there is already present marked change in the myocardium ; if there is a diastolic murmur, the condition is most serious. The relative strength of the aortic and pulmonary second sounds is a pretty fair index of the strength of the heart ; the more the pulmonary is accentuated, the weaker is the heart.

The treatment of anaemia may be summed up briefly as follows : Keeping the bowels, skin, and kidneys active ; a careful supervision of the diet ; regularity in eating ; the internal administration of iron and arsenic in varying proportions, according to the relative proportion in the blood of the haemoglobin and the red corpuscles ; the inhalation of pure oxygen gas ; exercise, passive or active, according to the condition of the heart ; the administration of tincture of nuxvomica in increasing doses to strengthen the cardiac action.

I think that we are all agreed that exercise is important for anaemic individuals, but I think it of the utmost importance that the condition of the heart should be the index to the character and amount of exercise.

The heart in an anaemic individual is just in the condition in which too great or too prolonged exercise may cause a dilatation that will produce a permanent mitral insufficiency, or possibly a worse condition.

Therefore, in those cases in which the physical examination shows aortic or tricuspid regurgitation, and in most of those in which mitral regurgitation is revealed, rest in bed for a more or less prolonged period, according to the effect produced, is indicated. The necessary exercise should be supplied by massage and muscular movements, given by one thoroughly competent.

The slow, deep inhalations of pure oxygen gas are of the utmost importance in these cases in that they supply the oxygen and conduce to full expansion of the lungs, thus improving the circulation and increasing the strength of the cardiac action. The administration of tincture of nuxvomica in gradually increasing doses is of great value in increasing the vigour of the myocardium.

The chief point I wish to emphasise in bringing this subject before you, is to urge the careful examination of the heart in all cases of anaemia, the location of the origin of the cardiac murmur or murmurs that may be present, and the regulation of the character and amount of exercise according to the findings of the physical examination.

# A CASE OF CARCINOMA VENTRICULI, WITH THE CONTINUED PRESENCE OF FREE HYDRO- CHLORIC ACID AND THE ABSENCE OF LACTIC ACID.

By CHARLES G. STOCKTON, M. D., of Erie County.

*October 16, 1895.*

This case of carcinoma ventriculi is reported somewhat in detail, for the reason that it presents some unusual features in its clinical history, and for the further reason that the results of treatment were somewhat striking.

The patient, a married woman, thirty-six years of age, a German, presented a good family history. She had never been sick until six years ago, when she experienced a dragging sensation, varied by severe paroxysms of pain, in the left lumbar region. Soon after there appeared blood and pus in the urine, and she is believed to have had a high fever for two or more months. Partial recovery ensued, but she has suffered occasionally since that time from pain in her left side.

For two or three years she has complained of a disturbed stomach, suffering at times severely from nausea and vomiting. I saw the patient first on the 25th of May of the present year. About six months before this time she discovered a lump below the sternum in the epigastric region. It was, and still is, movable and somewhat tender. About two months ago the vomiting became so severe that it was necessary to nourish the patient per rectum. She became greatly emaciated and cachectic, and the diagnosis of cancer was readily made by her attending physician and confirmed by a member of this Association. On my first examination I concurred in the diagnosis, and felt that the patient was beyond relief.

She weighed eighty-eight pounds; her pulse was rapid and feeble, her tongue fissured, red and raw-looking, the bowels much constipated, the urine scant, containing 5.76 grammes of urea,

but without albumen or pus. The stomach was extremely dilated, the lower border reaching nearly to the pubes. A kidney-shaped tumor, movable and slightly tender, was found in the epigastric region. The right kidney was very low and movable; the left kidney could not be palpated.

The examination of the vomited contents revealed a high degree of acidity, which depended mostly upon free hydrochloric acid. There was no lactic acid present, although the odour of butyric acid was very evident. These discoveries awakened my interest in the case. It was most unusual to find a patient thus advanced in malignant disease of the stomach, having at the same time free hydrochloric acid present, and lactic acid absent.

In spite of her enfeeblement it seemed worth while to give the case careful study. Lavage was therefore practised for the first time at noon on June 6, after a breakfast of eggs, bread, and peptonised milk. Three pints of foul-smelling, brownish, foaming contents were withdrawn. At the beginning of the lavage, food taken four or five hours before was removed, the stomach having been made to retain food by the administration of alkalies and sedatives. The examination of the contents at this time showed a total acidity of eighty-five per cent. Free hydrochloric acid was present somewhat in excess, and a slight reaction to Uffelmann's test for lactic acid was discovered.

On June 10, three hours after a breakfast of eggs and toast, about three quarts of foul-smelling, stagnated food were withdrawn, and the filtrate still showed an abundance of hydrochloric acid, but the total absence of lactic acid by Uffelmann's test, both with and without extraction by ether.

Later, the stomach having been thoroughly emptied at night, and the patient allowed the test meal of oaten gruel, the somewhat complicated test for lactic acid described by Boas,<sup>1</sup> which has been carefully reviewed by Julius Friedenwald, also failed to discover lactic acid. This test rests upon the fact that a solution of lactic acid is decomposed into acetic aldehyde and formic acid when it is heated with sulphuric acid and manganese dioxide. The aldehyde thus formed is detected by the formation of iodoform when it is led into a flask containing an alkaline solution of iodine. *Sarcinae* were not present.

The gastric discomfort and the vomiting of which the patient had complained were quite relieved by the administration of cerium, bismuth, and carbonate of magnesium. The intense con-

<sup>1</sup> *Münchener Medicinische Wochenschrift*, 1893, No. 43.



stipation was now readily controlled by laxatives. Repeated lavage restored the appetite of the patient. By the middle of June she had increased seven pounds in weight, and was courageous and happy. On the 16th of June she developed a phlebitis in the left popliteal region, which finally extended to the groin, accompanied by much tenderness, swelling, and pain, with some fever. Three weeks later, the phlebitis having subsided, the stomach was found to be in a very comfortable condition, and the vomiting had not recurred. Soon after this, however, the hydrochloric acid began to diminish and lactic acid to appear. By the middle of July lactic acid was constant, and free hydrochloric acid was regularly absent. Toward the end of this month the food stagnation returned somewhat abruptly, and it became impracticable to nourish the patient longer per orem, and it seemed that any further relief must be sought for in surgery.

It should have been stated that when the stomach was distended, the tumor was felt to be somewhat to the right of the median line, kidney-shaped, with the concavity looking upward and to the right, but immediately afterward, when the stomach was empty, the tumor was found to be to the left of the median line, and the concavity looking upward and to the left.

I was at one time led to hope that the diagnosis of carcinoma might be discarded. This view was partly based upon the history of previous trouble referred to the left kidney, at which time pus and blood were found in the urine, and partly upon the fact that the patient was gaining in flesh, colour, and appetite, that there was rather an excess of free hydrochloric acid in the stomach contents, while lactic acid was generally absent, and finally, upon the fact that the food stagnation had very much diminished under lavage and simple treatment. The later manifestations of the case, however, dispelled this hope. My colleague, Dr. Roswell Park, was invited to make an exploratory incision, with a view to such further operation as seemed advisable.

The exploration revealed a carcinomatous growth at the pylorus, with considerable infiltration of the anterior wall of the stomach. Secondary nodules were found in the neighbouring lymphatics. The tumor that we had discovered by palpation was the pyloric growth. The disease was too much disseminated to make excision practicable. It was therefore determined to do a gastro-enterostomy, which was performed by the suture method. The patient made a rapid and favourable convalescence from the operation, and was soon able to take food with avidity.

On September 4, about five weeks after the operation, the patient's stomach was emptied by aspiration. The fluid withdrawn showed bile in considerable quantity, but the food present was undergoing digestion, possibly from the presence of the pancreatic juice. There was no hydrochloric acid, but lactic acid was found. At this writing the patient is steadily gaining in general health; she weighs one hundred and thirty pounds, and is able to attend to her household duties, besides walking about the city, shopping and visiting, in better health than she has been for a year past.

Oppler<sup>1</sup> speaks of a class of cases in which lactic acid is never found, when the motor function is disturbed and when free hydrochloric acid is present. To such a class this case undoubtedly belongs. Oppler, however, says that sarcinae were found in these cases. They were found uniformly absent in the case that I have reported.

The history of this case teaches (1) that a patient reduced to great extremities from cancer of the pylorus may be greatly benefited and temporarily restored to reasonable health by proper procedures; (2) that when an extensive growth exists in the pylorus, and in other portions of the gastric parietes, free hydrochloric acid in excess may persist for months, while lactic acid (the diet meantime being properly restricted) may continue absent; (3) that a gastro-enterostomy may so far relieve obstruction and food stagnation that a patient may regain upwards of forty pounds of flesh in eleven weeks' time; (4) that some gastric digestion may proceed, after the gastro-enterostomy, in the absence of hydrochloric acid and in the presence of bile and the pancreatic juice.

A case similar to this is reported by Debove and Soupault,<sup>2</sup> in which after gastro-enterostomy a patient gained thirty-eight and a half pounds in three months' time, but in whose stomach, shortly after each meal, bile and pancreatic juice were found causing no disturbance.

<sup>1</sup> Quoted by Friedenwald in the *New York Medical Journal*, March 23, 1895.

<sup>2</sup> *Bull. de l'Acad. de Med.*, August 6, 1895.

## GASTRO-SUCCORRHOEA CONTINUA CHRONICA (REICHMANN'S DISEASE).

By MAX EINHORN, M. D., of New York County.

October 16, 1895.

Under the above name Reichmann, in 1882, described a pathological condition which is characterised by a constant secretion of gastric juice, even when there is no food whatever in the stomach. The stomach is found to contain considerable quantities of gastric juice, in the morning, even in the fasting condition.

*General remarks.*—In describing this new disease, Reichmann, in 1887, mentioned that he had observed sixteen cases. An exact scientific diagnosis had been made, however, only in six of them. "In the remaining cases," says Reichmann, "I was able to find in the stomach in the morning, in the fasting condition, a large quantity of a liquid containing hydrochloric acid and pepsin, and exhibiting digestive properties, but also containing much peptone and remnants of amylaceous food."

Among the six cases which Reichmann considered as typical of gastro-succorrhoea chronica, I think that only one (case 3) deserves this name, for the remaining five, aside from the constant secretion of gastric juice, presented other important lesions of the stomach, which in all probability were rather the cause than the effect of the constant gastric flow. In all the cases described by Reichmann, except in case 3, the stomach in the fasting condition contained a considerable quantity of liquid, consisting of gastric juice, and containing only amylaceous food remnants. When the stomach had been washed out on the previous night, and the patient had abstained from food and drink, the stomach

in the morning, nevertheless, contained clear gastric juice. These cases are then undoubtedly cases of dilatation of the stomach, or, more correctly speaking, of stenosis of the pylorus, in which hyper-secretion must be considered as a concomitant factor. Reichmann and, following him, especially the French writers, Bouveret, Delove, and Remond, and among the Germans, Boaz, have laid too little stress upon the distinction between the constant flow of gastric juice and dilatation of the stomach, due to stenosis of the pylorus. On this account, the picture given by these authors of the true gastro-succorrhoea chronica, bears a closer resemblance in many points to that of dilatation of the stomach than to the picture of the affection in question. Inasmuch as the treatment of cases of stenosis of the pylorus is in most essential points different from cases of gastro-succorrhoea (I need only mention that the most rational treatment for the former is a surgical one), it is absolutely necessary to strictly differentiate between these two conditions.

About two years ago, Schreiber, of Koenigsberg, published an extensive paper in which he doubted the existence of the new disease, and considered all the cases described by Reichmann as cases of dilatation of the stomach, with stagnation of food. Shortly afterwards, two other important papers appeared with reference to this question: Riegel defended Reichmann's views, while Martins was inclined to favour Schreiber's opinion. Whether Schreiber's view, that the stomach nominally secretes gastric juice, even while in its empty state, is correct or not, is a question that is quite difficult to decide, although I am personally of the opinion that when there is no food in the stomach, there is no secretion. But leaving aside this question about the physiology of the stomach, there is no doubt that, as a rule, the stomach in the fasting condition does not contain any considerable quantity of gastric juice. Whenever considerable quantities are found, the stomach must be considered as affected.

In this respect I agree with Reichmann as to the existence of a pathological continuous gastric succorrhoea, although I

shall restrict this name only to cases not presenting lesions of the stomach. Whenever the latter exist, I deem it best to look upon the accompanying gastric-succorrhoea as a consequence of the main trouble, but not the cause of the organic lesion. According to my experience, which coincides with that of Ewald, cases of genuine gastro-succorrhoea chronica are quite rare. They are less frequent than the periodic gastro-succorrhoea. During the last seven years, I have met with six cases of this affection, one of which I published in 1888. Before entering into the discussion of the pathology of this disease, it might be best to briefly describe one of my recently observed cases of gastro-succorrhoea.

A. S., twenty-one years old, has suffered since early youth from digestive troubles. As far back as he can remember, he has felt hungry very soon after meals (one hour). The bowels, although regular, were occasionally very constipated. Patient was always weakly, but in the last three years had been troubled in a higher degree. He felt extremely weak, became dizzy after meals, and was overcome by a feeling of sleepiness. The bowels became constipated all the time. During the last six or seven months, there was a sensation of extreme weakness in the hands and feet. The appetite was constantly increasing, and a hungry feeling appeared very frequently. Since three months there had been present a burning sensation in the gastric region, which increased in severity about an hour or two after meals. From that time on, patient began to vomit frequently. The vomiting, as a rule, occurred very soon after a meal, although occasionally it took place either in the middle of the night, or in the morning before breakfast. Patient had lost lately in weight (about ten pounds).

*Present condition.*—Chest organs intact. On palpitation, the gastric region is somewhat sensitive to pressure. There is, however, no circumscribed painful area. A splashing sound can be produced extending to about one finger's width above the navel. Tongue is thickly coated. Colour of lips and cheeks quite good, and the patient does not look emaciated. The knee reflex is present, and the urine does not contain anything abnormal. The examination of the stomach one hour after a test-breakfast, showed the quantity of chyme to be small (about 30 c. c.); hydrochloric acid+, acidity=100.



The examination of the stomach, in the fasting condition, revealed that the organ contained a considerable quantity of pure gastric juice ; 120 c. c. of a somewhat turbid liquid, not containing any food remnants whatever, were withdrawn with the tube. This fluid contained free hydrochloric acid, had an acidity of 80, gave only weak biuret reaction, while erytho-dextrine, dextrine, and sugar were totally absent. During the first three months of treatment, the condition of the stomach, in reference to its secretion of juice, did not change in any way. Repeated examinations, which had been made in the fasting condition of the patient, always gave the same result. Presence of about 100 c. c. or more of pure gastric juice.

The treatment consisted at first in regulation of the diet, and in the administration of large doses of alkalies. Later on, washing of the stomach and spraying of the organ with a one to two per mille solution of nitrate of silver was instituted. The latter means proved more effective than the above treatment, and after about two weeks, it was noticed that the stomach in the fasting condition contained considerably smaller quantities of juice. Thus 30 or 20 c. c. of juice were frequently found. The spraying was continued for two months, after which time the stomach in the fasting condition was usually found empty. This objective improvement was connected with a subjective amelioration of all the symptoms : the vomiting ceased, hunger was much less marked, the dizziness subsided, and the patient felt stronger and could do his work much better. The examination of the stomach one hour after the test-breakfast, however, showed that the hyperchlorhydria still persisted.

In this case we frequently tried to determine the motor (transportation) faculty of the stomach. One and a half hours after Ewald's test-breakfast, as a rule the stomach was found empty, showing that this faculty was rather increased. This is of interest, inasmuch as it shows that continuous hypersecretion need not be associated with sluggishness in the muscular action of the organ, a theory which is accepted by most investigators who have written on the subject.

#### AETIOLOGY.

Gastro-succorrhoea chronica is met with much more frequently in men than in women. In some instances there is

present, besides this affection, some other functional neurotic disturbance. In three of my cases the latter was very marked. Thus one of these patient complained of a burning sensation all over his limbs, which lasted for three months, and then suddenly disappeared. Like hyperchlorhydria, the gastro-succorrhoea seems to arise from great mental worry or strain.

#### SYMPTOMATOLOGY.

After a more or less prolonged period of different dyspeptic disturbances, which are similar in character to those caused by hyperchlorhydria, there appears a pronounced sensation of pain several hours after, and shortly before, meals. Very soon vomiting supervenes as a new symptom. At first it occurs only occasionally, but constantly grows more frequent, until at last there is either one or several vomiting spells every day. The vomiting appears most frequently soon after breakfast, sometimes also after supper. In only a few cases does it occur at night, about two or three o'clock, preceded by long and severe attacks of pain. The vomited matter is always very acid, and more or less liquid. The night vomit especially consists, as a rule, of a clear liquid containing hardly any food.

The appetite is generally increased, although there are exceptions to this rule. In some cases, periods of extreme hunger alternate with periods of severe anorexia. In most cases the sensation of thirst is greatly increased. In all of my cases, constipation was marked. In some there was present loss of weight, but none of my patients was emaciated in any great degree.

#### DIAGNOSIS.

Although the symptoms described might suggest the presence of gastro-succorrhoea in certain cases, the exact diagnosis can be made only by a repeated examination of the stomach in the fasting condition. By inserting the tube into the stomach, and telling the patient to exert some

pressure with his abdominal muscles, a more or less large quantity of liquid (60–100 c. c.) is obtained from the stomach. This contains *no food particles*, but exhibits all the properties of the gastric juice. It may look greenish from the admixture of bile, but this is not an important sign. The filtrate, as a rule, shows a somewhat increased degree of acidity. It never contains any starchy products (absence of erythro-dextrine, achroo-dextrine, and sugar). Microscopically no sarcinae or other signs of decomposition are found. Frequently cell-nuclei are met with in large numbers. In examining the patient one hour after Ewald's test-breakfast, the gastric contents will be found to contain more liquid than usual, and the degree of acidity will be quite high (80–120). As a rule, the degree of acidity of the gastric contents is higher than that of the gastric juice when withdrawn from the stomach in the fasting condition. In examining the filtrate of the gastric contents as regards the starchy products, it will be found that the Lugol solution will produce a deep violet or even blue colour; showing that the starch has not been much changed. A thin disk of a hard-boiled egg will be digested in the filtrate, at blood temperature, in about half an hour to an hour. The difference as to the degrees of digestion, of the albumates and starches (the former being quicker, the latter much more slowly digested), can be best studied after Leube-Riegel's test-dinner. Three to four hours after such a dinner, the obtained gastric contents contain hardly any meat particles whatever (all being digested), whereas particles of starchy food form the principal part of the mixture. In this way the difference between the digestion of meats and starchy foods existing in this affection is seen at once.

#### DIFFERENTIAL DIAGNOSIS.

In making the diagnosis of gastro-succorrhoea, all organic lesions of the stomach (ulcer and stenosis of the pylorus), which are liable to be accompanied with gastro-succorrhoea, will have to be excluded. According to my experience, it is

very easy to exclude stenosis of the pylorus, but not an ulcer. In stenosis of the pylorus, the stomach in the fasting condition is also found to contain a liquid, but this is mixed with food, and the filtrate always shows the presence of starch, or sugar products. But the main thing is that food particles can be seen, even with the naked eye, whereas, the liquid in the stomach, in case of genuine gastro-succorrhoea, does not contain any food particles as described above. The presence of an ulcer will be suspected if there has been a preceding hematemesis or melaena, or a circumscribed spot in the gastric region, very painful to the slightest pressure. The absence of these symptoms will tend to justify the diagnosis of gastro-succorrhoea.

#### PROGNOSIS.

According to my experience, the prognosis of gastro-succorrhoea is not bad. As a rule, most patients improve under rational treatment. Frequently, however, there are relapses. Some very obstinate cases are occasionally met with, and the trouble, although yielding somewhat to treatment, may persist for years. There is, however, no danger of a fatal issue resulting from this disease alone.

#### TREATMENT.

As we have seen, gastro-succorrhoea is always associated with hyperchlorhydria. The treatment of the latter condition in reference to diet, medicaments, and mode of living, will have to be resorted to here also. With reference to diet I have only to add that it is of great importance not to permit the patient to partake of any large quantities of liquid. In this affection more stress must be laid upon this point than in hyperchlorhydria. The treatment of gastro-succorrhoea must be directed towards decreasing the undue amount of gastric secretion.

1. *Medicaments.*—With this end in view, Voinoritch rec-

ommends the use of atropia in doses of two mgm. daily. Bouveret prefers morphia to atropia. Following the advice of Leuberscher and Scheffer, he administered two to three cgm. of sulphate of morphia three times daily in subcutaneous injections. This author doubts, however, whether this treatment, which seems to be effective in the initial state of the affection, will prove useful in cases that have progressed further. The use of either atropia or morphia may be tried for a short time, but they should never be administered for a long period. The subcutaneous injections of morphia, especially, should be avoided, as the patient runs the risk of becoming an habitu   of this drug.

2. *Lavage*.—Reichmann and, later, Riegel, recommended the use of lavage of the stomach as the best means of improving its condition. While Riegel washes out the stomach in the evening, six to seven hours after the last meal, Reichmann, and most writers, administer the lavage in the fasting condition. The latter way is also employed by myself; it has the following advantages:

(a.) That by emptying the stomach in the fasting condition, we are better enabled to judge the quantity of juice present at a time when, normally, there should be none.

(b.) That no food whatever is removed from the stomach.

Instead of lavage Boaz recommends emptying the stomach by means of a tube, in the fasting condition (expression method). In order to more effectively combat the undue secretion, Reichmann recommends adding nitrate of silver to the water used in washing out the stomach. After it has been washed out with plain water, 300 c. c. of a 1 to 2 per 1,000 solution of nitrate of silver are poured into the organ, and left there for about five minutes, when it is withdrawn by siphonage.

3. *Spraying the stomach*.—Instead of the latter proceeding I have sprayed out the stomach after the washing with a 1 to 2 per 1,000 nitrate of silver solution. In two cases I found this method of treatment of great benefit.

4. *Direct galvanisation of the stomach*.—The first of my



observed cases of gastro-chronica was a very obstinate one, and the affection did not yield much to either the medicinal treatment or to the use of lavage. I empirically tried direct galvanisation of the organ, and after a treatment of a few weeks the stomach began to be empty in the morning, and has remained so for several years. Since then it has been my custom to make use of this method in this affection, and I must say that the result has been very gratifying. Very often I employ both spraying with nitrate of silver and direct galvanisation, applying them alternately.

#### DISCUSSION.

DR. STOCKTON said he desired to accentuate some of the truths stated in Dr. Einhorn's paper. The condition described was at least sufficiently frequent to be met with by all general practitioners. He had seen several such cases, which had been previously treated for a considerable time by anodynes and the regulation of the diet, and with little apparent benefit. If these cases could be properly differentiated and treated, there could be but little doubt about the good result that would be obtained. Personally, he believed that this disease was a neurosis, and that it was dependent upon the condition of the general nervous system. It was quite probably produced by general over-strain and mental worry, and sometimes also by certain reflexes. While he had seen great relief to the gastric pain, in this condition, from applications of the constant galvanic current, he had not succeeded in relieving the succorrhoea—indeed, it had seemed to him to increase this latter element.

DR. ALLEN JONES, of Erie county, said that he had had the pleasure of studying, with Dr. Stockton, the case which the latter had just reported. In the course of these observations, he had noticed that the pyloric tumor had seemed at times to press upon the cardia, so that a slight resistance had been distinctly felt at a distance of about fourteen inches from the incisor teeth. It was possible, of course, that this obstruction might have been due to cardiac spasm, but the tumor had been so movable, and its position had changed as much as three inches in either direction, depending upon whether the stomach was full or empty, that he felt convinced that it was responsible for this resistance. He had made a careful, systematic examination for lactic acid, according

to the method devised by Boaz. Boaz found that all foods contained pre-formed lactic acid, therefore he gave a meal consisting of gruel, containing no pre-formed lactic acid. In the case under consideration no pre-formed lactic acid was found in the stomach. After this meal, however, a considerable quantity of hydrochloric acid was found, and it seemed probable that the hydrochloric acid might have prevented the development of the germs necessary for the production of the lactic acid.

Regarding Dr. Einhorn's paper, he felt that it was difficult to draw the line sharply between pure gastro-succorrhoea chronica and those cases in which there was, at times, a temporary dilatation of the stomach, or food stagnation. The name "ischo-chymia," applied by Dr. Einhorn, was an excellent descriptive term. Dr. Jones said that he had found food in the stomach as long as ten, twelve, and even twenty-four hours after a meal, and yet, under the treatment outlined by Dr. Einhorn, the stomach had returned to the normal size, and the constipation had been entirely relieved; hence, these cases could not be considered examples of real dilatation of the stomach, and if there were stenosis at the pylorus, it was only temporary. Such a stenosis might result from a tumid condition of the folds of the mucous membrane at the pylorus, owing to constant irritation set up by the gastric juice, or by the ingestion of improper foods, such as stimulating condiments. This view seemed to be supported by the clinical results of regulating the diet, employing lavage in the stomach. He had not found that the use of galvanism had caused a diminution of the gastric juice, but the galvanic, as well as the faradic, current, caused by its stimulating action, an increased flow of hydrochloric acid, and hence, galvanisation would seem to be contra-indicated. It was, of course, possible that the galvanisation would set up an improved innervation of the stomach, and so more than counterbalanced this action on the gastric secretion.

DR. A. E. GALLANT, of New York county, said that he had seen some of the cases referred to by Dr. Einhorn. He had observed eye-strain, in these cases, as an apparent aetiological factor. The effect on the stomach of the application of appropriate eye-glasses had, at times, been remarkable. Formerly, he had used the stomach-tube as advised by Dr. Einhorn, but more recently he had used this only for diagnostic purposes, employing in the treatment ichthylol, in the proportion of one to eight. It could not be denied that the remedy was disagreeable, but if given directly after a

meal, the patients would experience so much relief that they would be willing to continue its use in spite of the taste. He had taken the ichthyol himself, and while it had been regurgitated at intervals for twelve hours or more, the eructations had been less acid than before its ingestion. Dr. Weeks had examined these cases with him, and had found hyperopic astigmatism in almost all of these cases. Not only was the ichthyol an antiseptic, but it tended to relax the bowel, a desirable action in most of these cases.

DR. EINHORN, in discussing Dr. Stockton's paper, said that he had had three cases of cancer of the stomach, accompanied by free hydrochloric acid, or hyper-secretion. Two of them had been operated upon, the tumor found, and the diagnosis confirmed. One of these cases had improved rapidly for about six months, and had then died of the original disease; the other had died about one month after operation. Long before the researches of Boaz it had been known that lactic acid was frequently found in cancer of the stomach, but Boaz showed that in cancer of the stomach the quantity of lactic acid was enormous as compared with that normally found. It could not be considered, however, that this fact was in itself pathognomonic of cancer of the stomach. He had himself published a case refuting such an opinion. He agreed with Dr. Stockton that cases of gastro-succorrhoea were due to a neurosis. While it was difficult to make the differential diagnosis, as had been stated in the discussion, it was possible, by repeated examinations with the stomach-tube, to exclude the other condition most likely to be confounded with it—*i. e.*, stenosis of the pylorus. He had had four cases in which the diagnosis had been made upon the persistence of one symptom—the ischo-chymia. Even though the ischo-chymia subsided after treatment, it was no proof that the condition was not really one of stenosis of the pylorus, for clinical records show that such fluctuations are not uncommonly observed.

DR. AUSTIN FLINT, of New York county, said that these papers had touched upon a subject of special interest to him. The matter of the causation of stomach troubles was of great importance, particularly the causation of this very curious condition described by Dr. Einhorn, in which there appeared to be a constant secretion of a sort of gastric juice. In the normal condition of the digestive organs, he believed occasional variations and excesses were provided for by Nature. While it was proper that digestion should take place at certain intervals, an occasional gastronomic excess or

indiscretion might be permitted with impunity in a healthy individual. Thus, Nature had provided two kidneys and two lungs for meeting emergencies or unusual strains upon these organs. One of the great difficulties he had met with, in the treatment of indigestion, had been to convince patients of the physiological necessity of regularity in eating. The formation of the digestive fluids, he said, was now fairly understood by physiologists. A certain period of so-called repose was absolutely necessary for the production by the cells of the glands—salivary glands, pancreas and stomach glands—of the enzymes, or the active principles which give to the digestive fluids their digestive properties. At the times when these organs were called upon for the exercise of their function, by the ingestion of food, the supply of blood to these glands increased ten or fifteen times, and this stored-up digestive substance or ferment was washed out in the form of the secretion. If one ate two or three times between meals, one called upon them for secretion at odd times when they did not expect it, and they had gone to rest, or rather to quiet work. Such calls could be made occasionally, but when made frequently and at unexpected times, and when these organs, which, through the sympathetic system of nerves, possess a certain amount of intelligence—and certainly possess more knowledge about digestion than the average layman, and some doctors—were called upon constantly, one could only expect that there would be digestive disturbance.

The speaker said that he considered two great factors in the production of digestive disturbances were irregularity in diet, and eating more than one wanted. In factories where there was a large number of people taking their meals together every day; where widely differing tastes and capacities were to be satisfied, some individuals were almost sure to eat more than they wanted, and what they did not want.

## DISCUSSION ON SURGERY.

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### REMARKS INTRODUCTORY TO A DISCUSSION ON THE PROGNOSIS OF MALIGNANT TUMORS AS MODIFIED BY THEIR MANAGEMENT.

By JOSEPH D. BRYANT, M. D., of New York County.

*October 16, 1895.*

Among the wise sayings of Sophocles is this one: "A prudent man must neglect no circumstance." Although this sentiment was uttered nearly five hundred years before the birth of Christ, still it is as pregnant to-day with as wise forethought as then, and the precept is as applicable to the treatment of malignant tumors now as it was suitable then, and will ever be for the management of the ordinary affairs of life. The scope of this expression is measured only by the limits of ordinary human endeavour, and he who invests his efforts in the chances of human gain, must neglect no circumstance if he hope for the rewards born of pluck and discretion.

There is, perhaps, nothing within the circle of human desire and action to which this saying applies with a greater force than to the physical welfare of man himself. And yet, there is nothing half so important to which we give such belated thought and action as to many of our own physical infirmities. It often seems that the greater their gravity in this respect, the slower the awakening to danger. Too often, indeed, for the credit of human solicitude for the welfare of our kind, perfunctory thought and timid effort on the part of all concerned, afford disease every opportunity for action that it might desire, even were it endowed with the power of



intelligent advance. At this time, however, the attention is called only to disease of malignant nature.

The conflict against malignant processes should begin with the earliest dawn of their existence, and not cease until a triumph attested by time is achieved, or until a fatal issue destroys all hope and effort alike. In fact, the malignancy should be anticipated when possible and its chrysalis destroyed with the same spirit that quickens the annihilation of a viper's nest. He who allows the immunity of repose to a tumor of any kind may soon find that he has nurtured and guarded an asp that stings him for his care. The importance of this field of disease is especially emphasised by the fact that malignant disease is on the increase in the human family. This truth is well shown by the recorded increase of cancer in the United States.

Year.	Population.	Total deaths.	Deaths from cancer.	Cancer deaths per 100,000 from all causes.	Cancer deaths per 100,000 living.
1850	23,191,876	323,023	2,088	646	9.0
1860	31,443,321	394,153	3,672	932	11.7
1870	38,558,371	492,263	6,224	1,264	16.0
1880	50,155,783	756,893	13,068	1,815	26.05
1890	62,622,250	875,521	20,984	2,396	33.5

It may be a matter of interest at this time to note the fact that the death-rate from cancer in fifty large cities of this country is annually 39.54 to 100,000 living, being 16.34 greater to a 100,000 living than in the remainder of the country.

In certain portions of the United States cancer is apparently much more prevalent with the rural than with the associated urban population; as, for instance, on the north Atlantic coast the rural district shows 31.42 and the urban, 22.46 deaths from cancer in 1,000 deaths from all other causes. The middle Atlantic coast gives 20.25 rural to

19.93 of the city; north-eastern hills, 33.23 rural to 17.53 of the city (Worcester and Hartford); south Atlantic coast gives 15.94 rural to 5.70 of the city (Charleston) deaths from cancer to 1,000 from all other causes.

While it is no doubt true that much of the comparative increase in malignancy in the city over that of the country is dependent on the non-residents who seek relief there; still, this fact alone does not account for the entire increase, as is shown in those places where this factor can play no important part. As bearing on the increased mortality due to the non-resident phase of the question, one can do no better than to quote from the official report of Breslau, concerning the records from 1889 to 1892.

"The deaths from malignant tumors, which amounted to 14.9 per 1,000 of all deaths in 1877, but gradually increased to 25.4 per 1,000 in 1885, and 32.1 per 1,000 in 1891, show clearly the effect upon the local death-rates caused by non-residents, whose proportion of the total deaths of this class was 8.3 per cent. in 1886, 9.8 per cent. in 1887, 11.8 in 1888, 14.4 in 1889, 13.0 in 1890, and 13.2 per cent. in 1891."

Different portions of the body are attacked by malignancy, with varying and dissimilar frequency, as is made apparent by the following table and the analytical utterances of Dr. Billings:

"As regards the parts of the body which have suffered from the increase in the registered amount of malignant disease, it would appear . . . the increase has been shared by all parts, though by no means in equal proportions. When the rate of mortality from disease in any specified organ is very small, no great importance can, of course, be attached to the amount of its apparent increase or decrease, for the addition of one or two cases to the total deaths might double the calculated mortality. We must, therefore, in considering the individual organs, limit ourselves to those in which malignant new growths are of tolerably frequent occurrence; let us say those which gave a mortality in 1868 of not less than 15 per million. There were 12 such for

males, and under every one of these, with the single exception of the face, there was a notable increase, varying from 20 to 200 per cent. Among women there were 11 organs that gave severally in 1868 mortalities of more than 15 per million; of these, eight showed more or less increase in 1888, while in three there was a decrease.

"The following are the exact increases or decreases per cent. for each of these organs in each sex, the figures being put in brackets when the rates did not reach 15 per million in 1868, in one or the other sex:

PARTS AFFECTED.	Men.	Women.
Arms, legs, hands, feet.....	+73	-13
Mouth.....	+55	(-26)
Tongue.....	+67	-29
Pharynx, fauces, tonsils, throat.....	+44	-9
Stomach, pylorus.....	+22	+44
Intestines.....	+198	+273
Rectum.....	+102	+87
Liver, gall bladder.....	+124	+187
Bladder, urethra.....	+171	(+98)
Penis, testes, scrotum.....	+52	.....
Breast.....	+94	+9
Uterus, ovary, etc.....	.....	+19
Lip.....	+58	(+204)
Face.....	-6	+10
Abdomen (not more closely specified).....	+236	+142

It thus appears that the increase has been comparatively slight in those organs which are the commonest seats of malignant growths, namely, the generative and mammary organs of women, and has been largest, and this for both sexes, in the organs of the digestive and urinary systems, and notably in the intestines, rectum, liver, and urinary bladder. Among men there has also been a large increase in disease of what may be called the upper organs of the digestive system, namely, the mouth, the tongue, the pharynx, and the fauces, while among women there has been no such increase, but, on the contrary, a falling off."

The varying relations of malignant disease in different periods of time as related to the age of patients are apparent in the following table:

THE MEAN ANNUAL MORTALITY FROM CANCER PER MILLION PERSONS LIVING AT  
SUCCESSIVE AGE PERIODS IN 1851-'60 AND IN 1871-'80.

YEARS.	0	5	10	15	20	25	35	45	55	65	75 and upward.
1851-'60 .....	22	9	9	17	28	103	389	860	1,410	1,960	2,083
1871-'80 .....	13	7	8	17	28	125	530	1,263	2,214	3,116	3,333
Rate, 1871-'80 to rate 1851 -'60, taken as 100. }	59	78	89	100	100	121	136	147	157	159	160

Regarding this exhibit Dr. Billings says: "As regards age, these figures show that the increase has been by no means equally distributed over all the periods of life, but has been greater and greater with much regularity, the more advanced the age. Thus, among children under 15, the rates show a decline; from 15 to 25 they remain stationary, and then increase progressively with each successive advance of age."

The importance of nativity as influencing the variety of malignant manifestation in New York city is both interesting and instructive.

ONE THOUSAND DEATHS FROM CANCER IN NEW YORK CITY IN 1893, ACCORDING TO  
NATIVITY AND VARIETY.

NATIONALITY.	Population.	Unspeci- fied.		Sar- coma.		Scirrhus.		Epithe- lioma.		Total.	
		No.	Rate per 100,000.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
United States.....	360,399	167	46.34	23	6.38	17	4.72	12	3.33	219	60.77
Germany.....	403,784	305	75.5	19	4.7	10	2.47	6	1.48	340	84.2
Ireland.....	399,348	203	50.8	21	5.2	11	2.75	15	3.75	250	62.6
Italy.....	54,334	26	47.7	4	7.3	.....	.....	.....	.....	30	55.2
Bohemia .....	12,287	11	89.4	.....	.....	.....	.....	1	8.14	12	92.2
England.....	55,572	31	55.7	4	7.1	.....	.....	2	3.58	37	66.3
Scotland .....	19,627	16	76.8	1	5.0	.....	.....	2	10.19	19	96.8
Russia.....	80,235	32	39.8	4	4.9	.....	.....	.....	.....	36	44.8
France .....	16,239	7	43.1	2	12.3	.....	.....	1	6.15	10	61.5
Other for'n countries	61,835	43	69.5	3	4.8	1	1.6	.....	.....	47	76.0
Undistricted.....	13,128	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total ... ..	1,515,301	841	55.49	81	5.35	39	2.57	39	2.57	1,000	.....

Contrary to the usual expression, it is observed that those who suffer most from the hardships and vicissitudes of life, as the Italians and Irish, escape malignant manifestations more than do the thrifty and comparatively well-to-do Germans. It is noticeable, also, that but two nationalities, Italians and Russians, suffer from malignancy in a lesser degree than do those of our own nationality. Other inferences of theoretical significance can be drawn from this table, if time would permit, or the tenor of this discussion would encourage further deductions. Inasmuch as the subject is now before us in a semi-statistical light, I do not regard it amiss to introduce the following table, bearing on the relation of malignancy to age:

ONE THOUSAND DEATHS FROM CANCER IN NEW YORK CITY IN 1893 ACCORDING TO AGE OF DECEASED AND VARIETY OF CANCER.

AGE.	Unspecified Cancer.	Sarcoma.	Scirrhus.	Epithelioma.
Under 5 years.....	4	3	.....	.....
5 and under 15.....	.....	5	.....	.....
15 and under 25.....	2	5	.....	.....
25 and under 35.....	60	17	1	1
35 and under 45.....	154	12	7	6
45 and under 55.....	221	16	10	6
55 and under 65.....	226	13	6	9
65 and under 75.....	131	9	10	10
75 and under 85.....	34	1	4	7
85 and over.....	9	.....	1	.....
Total.....	841	81	39	39

There is nothing especially new exhibited by this table regarding the influence of age on the variety of the malignant growth. The synopsis but serves to emphasise similar representations already made, and is introduced here as an object lesson, not only because of its emphasis, but also as tending to tint this phase of the subject with a local sentimentality.



The relation between the organ attacked, the variety of the disease and the sex, is not only of unusual general interest, but also of special import, as it suggests not a little of the causal inception of these growths, and it also indicates clearly the most frequent sites of malignant tumors.

ANALYSIS OF ONE THOUSAND DEATHS FROM CANCER IN NEW YORK CITY IN 1893, ACCORDING TO VARIETY OF THE DISEASE, AND ORGAN ATTACKED, AND SEX.

ORGAN CHIEFLY AFFECTED.	Total.	Cancer, not further specified.			Sarcoma.			Scirrhus.			Epithelioma.		
		Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.
Stomach.....	253	240	127	113	3	1	2	9	6	3	1	1	....
Liver.....	116	112	53	59	1	....	1	3	1	2	....	....	....
Pancreas.....	8	8	4	4	....	....	....	....	....	....	....	....	....
Oesophagus.....	19	18	14	4	....	....	....	....	....	....	1	1	....
Rectum.....	42	38	121	17	2	2	....	2	....	2	....	....	....
Intestines.....	39	35	18	17	2	1	1	2	....	2	....	....	....
Other digestive.....	22	19	10	9	1	....	1	2	1	1	....	....	....
Larynx.....	6	5	4	1	....	....	....	....	....	....	1	1	....
Lungs.....	6	5	1	4	....	....	....	1	1	....	....	....	....
Uterus.....	196	168	....	168	13	....	13	7	....	7	8	....	8
Breast.....	91	78	....	78	2	....	2	9	....	9	2	....	2
Other female generative organs.....	16	10	....	10	4	....	4	....	....	....	2	....	2
Male generative.....	9	8	8	....	....	....	....	....	....	....	1	1	....
Kidney.....	7	4	2	2	3	1	2	....	....	....	....	....	....
Bladder.....	9	9	7	2	....	....	....	....	....	....	....	....	....
Brain.....	4	2	1	1	2	....	2	....	....	....	....	....	....
Tongue.....	18	11	8	3	2	....	2	....	....	....	5	5	....
Lower jaw.....	6	3	3	....	2	1	1	....	....	....	1	1	....
Upper jaw.....	2	1	....	1	....	....	....	....	....	....	1	1	....
Face.....	10	6	4	2	....	....	....	....	....	....	4	2	2
Thyroid gland.....	3	2	2	....	1	....	....	....	....	....	....	....	....
Others.....	95	42	22	20	37	16	21	4	2	2	12	9	3
Multiple or universal.....	23	17	6	11	6	2	4	....	....	....	....	....	....
Total.....	1,000	841	315	526	81	25	56	39	11	28	39	22	17

It will be noticed that those parts of the body which are of especial physiological significance, and which are exposed to the pseudo-traumatism incident to perverted appetite and mischievous customs, are foremost in the field of malignant enterprise. The tongue, oesophagus, stomach, intestines, rectum, uterus, and breast, furnish apt illustrations of this statement. On the other hand, those organs that are exposed to deleterious direct external influence, irrespective of their

<sup>1</sup> Includes 1 colloid cancer.

<sup>2</sup> Includes 1 melanotic cancer and 1 malignant papilloma.

<sup>3</sup> Includes 1 sarcoma of supra-renal capsules.

physiological importance, suffer in a minor degree. The lungs and larynx testify to this fact. It is noticeable, also, that the male sex suffer more from malignancy of the stomach, oesophagus, etc., those organs that are exposed to the vices of usage, than does the female, who errs less in this respect.

The period of life at which the organs are oftenest afflicted is seen to be the middle one; *i. e.*, from forty-five to fifty-five, and fifty-five to sixty-five, years of age.

ONE THOUSAND DEATHS FROM CANCER IN NEW YORK CITY IN 1893, ACCORDING TO AGE OF DECEASED AND ORGAN CHIEFLY AFFECTED.

ORGAN AFFECTED.	Total.	Under 5.	5 and under 15.	15 and under 25.	25 and under 35.	35 and under 45.	45 and under 55.	55 and under 65.	65 and under 75.	75 and under 85.	85 and over.
Stomach .....	253	...	...	1	15	30	69	75	45	16	2
Liver .....	116	3	...	...	3	22	28	29	27	2	2
Pancreas .....	8	...	...	...	...	2	1	3	1	1	...
Oesophagus .....	19	...	...	...	1	2	7	3	6	...	...
Rectum .....	42	...	...	...	6	8	8	13	6	...	1
Intestines .....	39	...	...	1	4	7	6	16	4	1	...
Other digestive .....	22	...	...	...	2	7	6	3	3	1	...
Larynx .....	6	...	...	...	1	2	2	1	...	...	...
Lungs .....	6	...	...	1	...	2	2	1	...	...	...
Uterus .....	196	...	...	...	20	51	51	52	18	3	1
Breast .....	91	...	...	...	6	13	28	21	14	5	4
Other female generative organs ..	16	...	...	1	2	7	2	2	2	...	...
Male generative .....	9	...	...	...	1	2	2	1	2	1	...
Kidney .....	7	1	1	...	1	...	...	2	2	...	...
Bladder .....	9	...	...	...	...	...	1	3	5	...	...
Brain .....	4	...	1	...	2	...	1	...	...	...	...
Tongue .....	18	...	...	...	1	5	5	3	4	...	...
Lower jaw .....	6	...	1	...	...	2	1	2	...	...	...
Upper jaw .....	2	...	...	...	...	1	1	...	...	...	...
Face .....	10	...	...	...	...	...	1	1	3	5	...
Thyroid gland .....	3	...	...	...	...	1	1	1	...	...	...
Others .....	95	2	2	3	11	9	21	21	16	10	...
Multiple or universal .....	23	1	...	...	3	6	9	1	2	1	...
Total .....	1,000	7	5	7	79	179	253	254	160	46	10

The stomach and uterus lead in this regard, and are closely followed by the breast. Inasmuch as the tissues are tenderer, more succulent, and more responsive to traumatism in the earlier period than in the middle, and since the earlier period offers but a few examples of cancer malignancy, it seems fair

<sup>1</sup> Including 1 melanotic cancer.

<sup>2</sup> Including 1 cancer of supra-renal capsules.

to regard as true that this malignancy, very rarely indeed, has its inception from the direct contact of similar agencies. It is seen (No. 7) that the first 45 years of life give 277 deaths from cancer, and that the next 20 years give 507 deaths, which are as equally divided as can be between the 10-year terms of the latter period. Surely the first 45 years of life are the period of greatest vulnerability, greatest activity and exposure, and it would seem, indeed, that if cancer gains its foothold in the human economy through the potency of a special infection, it ought to predominate at the period of life when the conditions best invite it, the same as do diseases of established infectious nature.

It might be said, perhaps, that the inception of the disease happens during the earlier period of life, and that it reveals its presence during the latter period. Certainly, if this be true, the nature of the infection is markedly changed by its newly-found association, for, from the time that its first effects come to our notice, it acts with a vigour characterised by promptness and perseverance to the end.

It will be noticed that those organs having the greatest functional activity, as the stomach, liver, intestinal tract, uterus, tongue, and even the lower jaw, are as a class afflicted more by cancer than are those of a less active character, and therefore endowed with a less vigorous vascular circulation. It is a well-recognised fact that the more mobile and vascular is the part afflicted with cancer, the more rapid the advance and the prompter is the return. The tongue is a striking example of this peculiarity. If analogy be of any service in the consideration of this phase of the question, then the first period of life—the first 45 years—should be fruitful indeed of malignant growths that are conceived by infection.

As before stated, it is noticeable that those organs of the body that have especial physiological significance, and are exposed to the pseudo-traumatism of perverted appetite and mischievous customs, are foremost in the field of malignant enterprise. The examples of this declaration were

stated but a moment ago. While it might seem at first blush that this preponderance of disease argued in favour of local infection, yet a moment's reflection, supplemented with the fact of a greater local vulnerability of the tissues during the 45-year period of life, would seem to indicate that the final outcome—the malignancy of the second, the 20-year period—is the result of local irritation incident to the emunctory functions of these organs, rather than to a special infection. The frequent occurrence of cancer of the human breast from irritating causes alone is confirmatory of the probability of this manner of inception in connection with the series of organs just enumerated.

The discovery of a tumor in the human economy demands a prompt diagnosis of the exact nature, not only in the interest of science, but also in recognition of the fraternal instincts that beget human brotherhood. Too frequently, however, the vanity, the dread, the indifference as to one's self, and thoughtlessness, lead to delay in the discovery, to delay in the acknowledgment, to delay in the treatment, and to delay in everything important except in the development of the neoplasm itself. If, now, to this unfortunate though common policy of patients and friends be added medical and surgical complacency, then, indeed, is the everyday picture complete.

Prompt discovery and acknowledgment of the presence of a tumor, prompt and proper advice as to treatment, prompt and complete removal of the initial growth and infected tissues, should characterise the local treatment of malignancy; and until this policy of treatment is thoroughly instilled into the minds of patients and friends, and not a few disciples of Hippocrates, will the prognosis of malignant disease improve. This I know to be true because the prognosis is improved already by prompt and thorough operative procedures alone. The education of the young and old alike to disclose their infirmities to the friend and physician, rather than to hoard the knowledge with a miserly grasp that destroys the main chances of recovery, should be regarded as a religious duty.

A prompt diagnosis contemplates the consideration of the clinical and physical aspects of a case. I shall, however, deal only with the latter, and here, too, with the crucial tests alone. Lymphatic involvement, adhesions to contiguous tissues, and morbid contractions at the seat of the growth, are all well-known manifestations of malignancy. However, exploration of the growth before operation by the harpoon or knife, and at the time of the operation by the knife alone, and the microscopical examination of the specimen, constitutes evidence that cannot be gainsaid. It frequently happens, however, that the microscopic eye is not at command, and then reliance must be placed on the macroscopic appearance alone, as a guide to further procedure. One who is familiar with the gross appearances of the divided surface of a malignant growth, can recognise the nature quite as surely as with the aid of a microscope. Yet not infrequently doubts arise in both instances, and then the benefit of the doubt should be given to the patient and not to the tumor.

Some time since, Mr. Herold Stiles, of Edinburgh, determined that when thin slices ( $\frac{1}{4}$  inch) of malignant tissue were placed for a few hours in a mixture of five parts of nitric acid and one hundred of methylated spirit, and then plunged into water, the nitric acid so changed the tissues while thus immersed as to present a characteristic picture composed of an opaque aggregation of epithelial cells surrounded by swollen connective tissue. A knowledge of this fact may be of some practical importance in the absence of a better means of discernment.

The importance of the complete extirpation of a malignant growth is a matter of easy settlement. No operation that contemplates the unnecessary leaving of any portion of the initial malignancy, or of associated diseased lymphatics or other tissues, is entitled to the dignity of being regarded as a proper method of procedure, or a proper measure of surgical attainment.

The surgeon who omits the removal of the lymphatics that are directly associated with a malignant growth, simply



because he can detect in them no increase in size or other manifestations of involvement, fails sadly in his duty. There can be but one of three reasons to account for this omission:

1. The belief in the fact that a failure to detect the presence of enlarged glands is conclusive evidence of the non-infection of glands.

2. That the removal of enlarged glands exercises no important influence on the prognosis of the case.

3. The blighting influence on the operator of indifference or timidity.

That glands are enlarged and yet escape the scrutiny of manipulation is a matter of common observation in the practise of surgery. I have often exposed by free incision enlarged lymphatic glands, whose condition could not have been otherwise determined. And, too, lymphatic glands may become infected before an appreciable enlargement of them takes place. This fact is not only theoretically probable, but is found practically to be absolutely true.

It should be further stated, I think, that the infection of lymphatic glands does not always begin with the first series and gradually extend to the last. On the contrary, not infrequently the first series escape wholly or in part, while the remoter ones arrest and develop the infection with irregular though unvarying certainty. This dissimilarity of infection of individual glands should emphasise in no uncertain manner the truth that the absence of infected glands in the usual situation is no confirmation of the fact that infected glands are not present elsewhere and close at hand.

The length of time from malignant inception of a growth to glandular infection cannot be determined with a sufficient degree of certainty to be of practical use. The time of secondary infection depends on the nature of the neoplasm and the organ attacked. Epithelioma infects slowly; the common forms of carcinoma, at an earlier period; medullary carcinoma, still earlier than the latter. Tumors rich in cells and of abundant vascularity infect the lymphatic nodes.

much more quickly than do those of diverse characteristics, or those abounding in fibrous tissue.

Gross gives the average date of lymph-node involvement as 14.7 months in cancer of the female breast. In the last two cases of this disease coming under my own personal care, one of six months', the other of three months', duration, the axillary glands were unequally involved in each, and, too, this fact was not apparent in either until disclosed by an explorative incision addressed to the axilla for that special purpose.<sup>1</sup> I am convinced that the exploration method of discovery is the only true test of the exact state of affairs. The manipulation of the axillary contents, with the view of discovering lymph-node enlargement, is unreliable and misleading, so much so that the scientific importance of all conclusions based on it can be promptly and wisely questioned.

The importance of the removal of enlarged lymphatics in malignant disease of the breast, and, therefore, in other portions of the body, is clearly shown by the following records: Gross analysed 136 cases of amputation of the breast for carcinoma, in which recurrence happened, and found that in 43 instances in which the lymph nodes were not apparently affected at the time of the operation, the average duration of life from the beginning of the disease was 52.7 months, while in 93 cases in which the glands were involved at the time of operation the duration was only 39.3 months. In the first class of cases the disease reappeared with an eight months' average, and in the second with a two months'. As Dr. Curtis very properly says in this connection, "Gross's collection of cases was made from those published up to about 1885, and gave only 11.83 per cent. of cures, with a mortality of 14 per cent." These figures have been improved so much since that time by advanced operative methods, that although they fully emphasise the importance of infected lymphatics, still they do not properly reflect the latest results of operative cases.

<sup>1</sup> The report of Dr. Dunham on the latter case announced "cancerous degeneration of the lymph glands."

Poulsen's collection of cases more nearly represents the outcome of later methods of procedure. He found that 22 per cent. of all of his cases of amputation of the breast, irrespective of glandular infection, remained free from disease for three years or more, while in 43 cases in which microscopic examination of the glands showed the presence of infection therein, only 9.3 per cent. were well at the end of that time.

Surely these figures demonstrate the importance of early operations—operations performed before infection of the lymph-nodes can have taken place. At what period does this infection happen? No one can tell. The later and more thorough methods of practise—those contemplating the “cleaning out of the axilla,” removal of the pectoral fasciae, etc., exhibit a not less than 26 per cent. rate of recovery when gauged by the three-year period of cure. It now appears as if this result will be still further improved by prompter action and a more thorough dissection for diseased tissues. At all events, the 11.83 per cent. recovery of Gross, reported up to 1885, is now more than doubled by Bull (26+ per cent.) reported in 1894. The latter are the product of thorough methods, methods that have in view the search for, and the wise removal of, all local manifestations of diseased action. The gaping wounds of a free dissection can be promptly closed by skin grafting, if other means fail; and by this course quick and firm union speedily closes the wounded surface.

But a word need be said, as it seems to me, regarding the means of removal of malignant growths. The knife is the only suitable means. The knife acts quickly and painlessly, widely and thoroughly; the wounds heal promptly and firmly, and with a minimum degree of deformity. The advance of the knife is guided by the skill and intelligence of the operator, and not by chance; and its use causes the least possible irritation of the lymph channel.

Caustics act slowly, painfully, circumscribedly, incompletely, and the use is attended by the maximum of lym-

phatic irritation. The wounds of a caustic heal tardily by granulation, and are followed by the maximum of deformity. The employment of caustics angers lymphatics, and the exclusive use does not contemplate the search for, and removal of, contiguous areas of infection, for obvious reasons.

No better illustration of the circumscribed and incomplete action of caustics, together with the refutation of the power of tissue selection so frequently ascribed to them, can be found than is the following case :

Some seven years ago, an old and honoured member of this association, and a personal friend of many of us, became afflicted with epithelial cancer of the lower lip. Strange as it may seem, yet stranger still it was, that this physician consulted the high priest of caustics, who flourished at that time near the central part of the state, for relief. Within four weeks after a painful and so-called removal with caustics, cervical glandular enlargement ensued. This secondary manifestation was promptly removed by a leading surgeon of this city, along with the scar of the lower lip. A microscopical examination revealed the presence of well-marked, abundant cancerous tissue at the borders of the cicatrix. Surely this tissue would not have been present in so short a time if the knife had been employed instead of caustics.

The removal of a malignant growth and the sending away of the patient without parting words of caution on the part of the surgeon to some one, is the essence of complaisant cruelty, or of sentimental cowardice. Conduct like this not only lures the patient and friends into a state of quiescent security, but also, for this reason, too, often robs him of the benefits of a second operation. On the contrary, the patient himself, or responsible friends, should be told of the liability of return, and that the reappearance must be watched for at the seat of removal and in contiguous associated lymphatics. Impress upon them the fact that these reappearances are insidious in their approach, and that it will require frequent and judicious periodical examination to determine the presence of the first expression of return. Finally, assure them,

in no uncertain manner, that with a prompt detection and a prompt and thorough removal, the prognosis will yet be favourable.

I am constrained to advise that a careful monthly examination for the presence of disease should be made by a competent physician, who is duly imbued with the importance of his task. Hand in hand with the surveillance should go the employment of medicine and measures that increase the tone of the physical status of the patient. All things that tend to lower the physical tone and the spirit of the patient, should be carefully avoided.

Special remedies, as arsenic, mercury, iodine, etc., can be used from time to time with becoming discretion. Arsenic appears to possess some special advantages over all other medicinal remedies in the treatment of sarcomatous diseases, notably of the skin. This fact has been forcibly emphasised already by Professor Sherwell of Brooklyn, with striking examples of relief.

Recurring malignant tumors should be promptly removed, along with their companion manifestations, whenever complete extirpation can be practised without undue danger to the life of the patient. I regard the incomplete removal of a malignant tumor as unwise and pernicious, except it be done for the purpose of euthanasia. All malignant growths that do not admit of complete removal should be regarded as inoperable, and be treated thereafter by constitutional means of cure.

To-day the employment of toxines of erysipelas, etc., appears to offer additional hope to patients afflicted with malignancy, especially of the sarcomatous nature. All inoperable tumors of this character, and all patients afflicted with present or prospective sarcomatous malignancy, should be thus carefully treated. However, the employment of toxines should not supplant the use of the knife. They should be used conjointly—knife first, toxine next, and the toxine when the knife is not admissible. Dr. Coley, who has given great attention to this subject, and is competent



to address you on all of its phases, will explain to you much more fully than I can the technique and result of its use.

In conclusion, I desire to submit the following propositions for your consideration :

1. That the relations to cancer malignancy of the functions and vulnerability of the organs commonly attacked, together with the known rapid development after malignant inception, are opposed to the theory of malignant infection.

2. That earlier detection, prompter and completer ablation of malignant manifestations, together with continued and stricter surveillance, offer now the only means of increased cure from operative measures.

3. That the intelligent and repeated use of the knife is the only method of practise that should be employed for the ablation of malignant growths.

4. That all measures, of whatever kind, that strengthen and cheer the patient, are important aids in the treatment of malignancy.

5. That although the use of toxines appears to offer additional means of relief, they should be employed as an aid, and not as a substitute for the knife.

# THE NATURE, MODES OF PROPAGATION, AND COMMONER SITES OF TUMORS.

By EDWARD R. DUNHAM, M. D., of New York County.

*October 16, 1895.*

I have been requested to devote the time allotted to me in this discussion to a consideration of the dissemination of tumors from their primary sites to other portions of the body—the phenomenon called metastasis.

1. This property, possessed in the highest degree by the tumors clinically regarded as the most dangerous to life, has come to be regarded as, perhaps, the most striking sign of malignancy. And the process resulting in metastasis may be most easily and fully studied in cases of malignant neoplasms.

The malignant tumors are characterised by a comparatively low degree of differentiation of the tissues composing them, and the more malignant the growth, the less advanced is that differentiation. If, therefore, the quality of malignancy goes with this lack of differentiation, then the liability to the production of metastasis should also go with it, and the structure of a tumor should give an index as to the chances of its spreading to distant parts of the body.

2. When we test this general proposition by the records of cases reported in medical literature we find that in the main those records tend to confirm it, but that there are certain exceptions, which deserve a little study because of the practical importance of the rule we are seeking to verify. Among these exceptions are several reported cases of metastasis of cartilaginous tumors<sup>1</sup>—tumors containing tissues of a high degree of differentiation. If such tumors really pro-

<sup>1</sup> V. Biesiadecki. Sitzungsbericht d. Wiener Akademie, LVII.

Berch-Hirschfeld. Zur Casuistik der Geschwulstembolie. Arch. f. Heilkunde X. 1869.

Paget. Med. Chir. Trans. XXXVIII, 1865.

Weber. Zur Geschichte des Enchondroms, etc. Virch. Arch. XXXV, 1866.

duce metastatic secondary growths that fact would militate against our rule, and it is, therefore, of great importance to learn whether cartilage, when it composes a tumor, can suffer metastasis. In order to settle this point I have taken some pains to study the original accounts of these cases, and have not been able to convince myself that they were really cases of pure chondroma. It is a well-recognised fact that cartilage frequently forms a not inconsiderable constituent of mixed tumors, in which it is associated with mucous tissue and some variety of the undifferentiated connective tissues which we group together under the name sarcoma.

The descriptions given in the reports of the histological characters of the cartilaginous tumors from which metastases arose, lead me to believe that they were of this mixed character, and it is to the sarcomatous elements they contained that I am inclined to attribute their malignant qualities. The tumors appear to have spread, because they invaded the walls of the larger lymphatics or veins, and subsequently projected into the lumina of those vessels; then, in consequence of their soft consistency, portions were carried to distant parts by the fluids circulating in the vessels. The fact that they infiltrated the walls of the vessels, instead of simply compressing them, tends to confirm this opinion of their mixed character.

I am also strongly inclined to take a similar view of the cases in which it is reported that myxomata have produced secondary tumors by metastasis. A pure myxoma is a rarity. Mucous tissue, when it occurs in a neoplasm, is usually associated with some other tissue, and very frequently with tissues presenting all the characteristics of sarcoma. Such a mixed tumor should naturally be susceptible of metastasis.

3. Having cleared the field of these historical anomalies, we may, with a fair degree of confidence in its substantial accuracy, draw the conclusion that a susceptibility to metastatic dissemination is one of the essential characteristics of malignant neoplasms, and that it is confined to them.

4. The next step in our inquiry, is to learn, if possible, upon what peculiarity of structure this susceptibility to metastasis depends, and whether those peculiarities can be stated in simple terms which shall apply to all tumors of this class.

We find that all malignant tumors have a highly cellular structure, with a minimal or very slight amount of any intercellular substance; that, therefore, the cells are very loosely held together. In the higher types of tissues, which compose the benign tumors, the reverse is the case. There the cells are surrounded by an abundant intercellular substance, which fixes their positions. Even in those normal tissues in which there is epithelium, where the cells are separated by a mere "cement," groups of those cells, or whole strata of them, are bounded by the intercellular tissue produced by other cells, belonging to the connective tissues, in such a way as to mechanically hold them in certain well-defined positions. In the malignant epithelial neoplasms this imprisonment through intercellular materials is suspended, and the epithelial cells are held together only by the almost insignificant amount of cement peculiar to all epithelium.

We may, therefore, reasonably conclude that a susceptibility to metastasis finds its mechanical, and, in consequence, its structural, explanation in the relative absence of confining intercellular substances.

Among the sarcomata we find a considerable variation in the amount of intercellular substances, and in harmony with that fact we find that the observed chances of metastasis appear to be in about inverse ratio to the abundance of those substances.

5. It will appear from the foregoing considerations that the occurrence of metastasis is to be referred to the carrying of cells derived from the primary growth to some new site, where those cells, through a continuance of their multiplication, produce a second tumor, corresponding in character as closely to the original neoplasm as the local conditions permit. The essential condition is that the transferred cells shall continue to multiply; the exact structure of the

resulting aggregate of cells will depend upon the behaviour of the tissues surrounding them in their new positions.

The mere transplantation of cells may not always result in the production of a secondary growth. In a great number of instances the cells will die, and to this circumstance must be ascribed the failure of most of the efforts to produce artificial metastasis by transplanting the cells of tumors from one individual to another. This should be the anticipated result where the individuals are of different species. Such experiments have, occasionally, been successful where the transplantation was made from one animal to another of the same species, of approximately the same age, and the operation conducted in such a manner as to surround the transferred cells with conditions simulating those obtaining where metastasis takes place spontaneously.<sup>1</sup> These *transplantations* are not to be regarded as *inoculations*, the distinction being that in one case we simply transfer growing cells from one nidus to another; while in an inoculation we introduce some agent, which through its influence upon the tissues causes them to react in some peculiar manner. Speaking roughly, in one case we transfer the *disease*; in the other, the *cause* of the disease.

6. It remains for us to study the process of metastasis more in detail, and for this purpose we must consider the different classes of malignant tumors separately.

Let us begin with the carcinomata.

The essential characteristic of a carcinoma resides in its display of an atypical, apparently purposeless proliferation of epithelial cells, which have become emancipated from their subjection to the imprisoning influence of the connective-tissue and intercellular substances, and which multiply in spaces, either preëxistent as lymph-spaces, or formed by a separation of the connective-tissue elements, the latter either remaining passive or assuming a more or less proliferative

<sup>1</sup> Novinsky. Centralblatt f. d. Med. Wiss. XIV, 1876, p. 790.

Wehr. Arch. f. Klin. Chir. XXXIX, 1889, p. 226.

Hanau. Fortschr. d. Med. VII, 1889, p. 321.

Morau. Comp. Rend. CXVII, No. 1, p. 62.



activity, allied to the part they play in the inflammatory process.

Hauser<sup>1</sup> holds, as the result of his observations on carcinoma of the stomach and intestines, that the malignant growth may be conceived to have started at the moment when the proliferating epithelium of the glands, from which the growth springs, bursts through the *membrana propria* which normally holds it in place. It is probable that carcinomata in other situations have their beginnings in a perfectly analogous occurrence.

As soon as the epithelium has burst its normal bounds in that way, the cells composing it find lodgment in spaces, in the surrounding tissues, communicating more or less directly with the lymphatics.

Here we have conditions favouring the production of metastasis. The cells are liable to be forwarded through the lymph channels by the fluids circulating in them, and eventually to be carried to the nearest lymph-gland, where their progress is arrested. The local condition of the part, whether oedematous, inflamed, or the site of some previous morbid process, will influence the readiness with which the neoplastic epithelium is conveyed through the channels in the tissues. The transfer may take place early or late in the history of the primary growth, but the possibility of its occurrence is given at the very start when the malignancy of the epithelial proliferation is inaugurated by the insufficiency of the interstitial restrictions upon the epithelium. This idea that the metastatic growth is merely the result of a transplantation and not an infection, is supported by two facts—(1) the fact that those cells which lie in the lymphatics of the new site are multiplying, as is proved by the abundant presence of mitoses in the cells; and (2) the fact that when the new site already normally contains epithelium, that epithelium suffers atrophy, and does not proliferate when the cells from the primary tumor are carried to the new site and multiply there.

<sup>1</sup> Das Cylinderepithelcarcinom des Magens und des Dickdarms. Jena, 1890.

A similar atrophy of the lymph-adenoid tissues takes place when lymph-glands are the seat of carcinomatous metastasis. The transplanted epithelial cells find lodgment in the cortical lymph-sinuses and continue their proliferation, until, finally, the whole lymph-gland is replaced by a carcinomatous nodule.<sup>1</sup> In the lymph-glands the proliferating epithelium comes into very close relations with very thin-walled blood-vessels, lying in a friable, lymph-adenoid tissue. According to Petrick [*loc. cit.*] these vessels become hyperaemic, their endothelial lining swells, and the tunica media of the small arteries and veins proliferates. It would appear, then, that in the secondary carcinomatous nodules in the lymph-glands the proliferating epithelial cells are placed under conditions likely to favour their entrance into the blood current, by means of which they would then be carried to distant parts of the body, as, for example, the lungs or the liver.

In accord with these facts, are the statistics giving the distribution of secondary growths in the organs of individuals dead from general carcinosis. Such statistics, gathered from the records of the Pathological Institute at Bern, are given by Max Mueller,<sup>2</sup> who found nodules in the liver in 28.2 per cent. and in the lungs in 12.2 per cent. Next to those two organs came the bones and kidneys with 5.7 per cent.; the adrenals, 4 per cent.; pancreas, 3 per cent.; brain, 1.9 per cent.

7. Let us now concisely sum up the results of the foregoing considerations.

We have found that a carcinoma appears to be produced when a certain definite normal relationship between the epithelium of a part and the surrounding interstitial tissues is disturbed; that then the proliferating epithelium finds its way into interstices of the neighbouring tissues.

Now, it is well known that a carcinoma enlarges by infil-

<sup>1</sup> Georg Petrick. Ueber die Verbreitung des Carcinoms in den Lymphdruesen. Inaug. Dissertation, Leipzig, 1891.

<sup>2</sup> Beitræge zur Kenntniss der Metastasenbildung maligner Tumoren. Inaug. Diss., Bern, 1892.

trating the tissues surrounding it, and that it has no clearly defined circumscribing boundary. I would suggest that this infiltration is really a minimal metastasis, which is merely somewhat exaggerated when the neighbouring lymph-glands are invaded, and reaches its maximum extent when the epithelial cells are carried to distant parts of the body by the blood current.

This generalisation reduces the whole process to its simplest terms, and permits the exceedingly important, practical deduction, which is borne out by clinical experience,—that the time when metastasis to a distance occurs bears no relations to the size or age of the primary neoplasm.

8. Turning our attention to the sarcomata, we find that, as a rule, they infiltrate the surrounding tissues only to a limited extent. The exceptions which depart to the greatest extent from this rule are to be found in cases where the sarcoma is of the most highly cellular type, with very little intercellular substance; in other words, where the actual structure of the neoplasm most closely approaches the epithelial portions of the carcinomata. In such cases the conditions are not unlike those already considered under cancer, and it is not rare to find a metastasis through the lymph-channels in such cases preceding that by the blood vessels.

Such lymphatic metastasis is, however, comparatively rare among those sarcomata showing a higher differentiation of structure, where the tendency to infiltrate their surroundings is but slight. We must look for some other relationship to account for metastasis of these tumors, and we find it in the close proximity of their component cells to thin-walled blood vessels penetrating the whole mass of the tumor. Since sarcomata spring from some vascularised form of connective tissue, and the blood vessels of that tissue participate in forming the growth, the close relationship between the cells of the tumor and the newly developing blood-vessels must be a constant one, to be observed in all sarcomata. This close connection finds its extreme exemplification in sarco-

mas in which the walls of the blood-vessels appear to be formed by certain cells of the tumor itself.

9. It is evident, from these structural characteristics of sarcomata, that the probability of cells entering the blood current, depends, chiefly, upon the firmness of the tumor itself; and its consistency will be in direct proportion to the amount and solidity of the substances between the cells of the neoplasm. If there be little intercellular substance, and that of soft consistency, the chances of metastasis are great. This is the case with most of the small, round-celled sarcomata. At the other extreme, we find sarcomata possessed of so much intercellular substance of fibrous character, that they simulate highly cellular fibromata. Experience shows that such tumors are not apt to undergo metastasis.

10. The situations in which metastatic sarcomata are most likely to appear, harmonise perfectly with the view of their mode of dissemination suggested by an examination of their structure. Max Mueller [loc. cit.] found metastatic sarcomata in 33 per cent. of his cases in the lungs; in the kidneys in 14.8 per cent.; in the bones in 12.7 per cent.; in the liver in 11.7 per cent.

11. In both sarcoma and carcinoma we may, upon occasion, find cases in which the neoplasm has invaded the walls of larger blood-vessels or lymphatics, and then pushed its way into the lumina of those vessels in such a way as to permit portions of their substance to be torn off by the circulating fluids. Metastases arising in this way may, perhaps, be regarded as an accidental consequence of the situation of the growth. They do not represent a natural result of the structural characteristics of the tumors from which they spring.

12. The modes of dissemination of the malignant neoplasms that we have been reviewing bear no marked relationship to the size of the tumors. As soon as the tumor forms, it is liable to metastasis.

No more conclusive argument in favour of prompt operative interference could be offered.

## THE PROGNOSIS OF MALIGNANT TUMORS AS MODIFIED BY THEIR EARLY DETECTION AND PROMPT ABLATION.

By J. W. S. GOULEY, M. D., of New York County.

*October 16, 1895.*

The nature and treatment of tumors cannot be too frequently discussed, because improved methods of study and of cure are almost invariably evolved from such discussions, and because intelligent lay readers of these dissertations will not fail to accept well-founded conclusions, and partly through them the general public will be made aware of the danger of procrastination of radical treatment of tumors. Thus great sufferings will be mitigated and countless lives prolonged. Many phases of questions relating to the early detection and prompt radical treatment of morbid growths, together with the establishment of the prognosis, are likely to be closely scrutinised by the inquirers appointed for this purpose, and information of much value may be expected as the outcome of their collective investigation.

Uncertainty in the determination of the nature of certain morbid growths, the strife for an accurate diagnosis before ablation, and the consequent long delay in arriving at a final conclusion, due sometimes to difference of opinion among consulting physicians, have in many instances caused patients to wait until innocent tumors became malignant. Therefore it seems rational to advise early excision of all accessible tumors as soon as discovered, deferring the completion of the diagnosis by the aid of the microscope until they shall have been extirpated. The knowledge of the metamorphic tendency of tumors is sufficient to warrant the excision of growths believed to be benign even in the earliest period of their development. Mott, Stevens, Watson, Wood, and



many other eminent physicians of the past generation, seldom expressed a positive opinion of the nature of particular tumors until they were excised, and commonly answered, "It is a tumor and should be removed." After dissecting the excised growth they were generally able to form a notion of its character and establish the prognosis.

The published results of great numbers of cases have shown that the prognosis of malignant tumors is markedly modified by their early ablation, and it is well known that when tumors are excised in their incipiency the period of immunity from recurrence of the disease is often prolonged many years, this long immunity being regarded as equal to a cure by physicians of large experience. These happy results have been attained in cases of sarcoma as well as of carcinoma. The writer's clinical and histological study of tumors during many years has led him to believe that the vast majorities of external malignant tumors are developed as benign growths, which, by a retrogressive process in their structure, become malignant. He therefore long ago began to act in accordance with the belief that scarcely any external tumor is too small to be excised. The number of favourable cases illustrative of the propriety of early excision of tumors, whether benign or malignant, appears to be increasing rapidly, owing, probably, to the more general belief than formerly that benign tumors are liable at any moment to become malignant; and the practise during the last two decades of excising tumors tending to retrograde metamorphosis demonstrates that this prompt action has had the effect, in many instances, of greatly prolonging the period of immunity from recurrence of the disease.

The very widely promulgated irrational idea that "so long as a tumor is not painful and is not rapidly increasing in size it should not be extirpated," although now rejected by the majority of physicians, still lingers in the public mind. It therefore becomes the duty of every physician to inform his clients of the danger they incur by neglect, or by submitting their cases to the baneful devices of charlatans. It is grati-

fying to record that many physicians are striving to educate the people respecting unnatural growths upon the body, and are pointing out to the afflicted the risks of allowing tumors to attain inordinate dimensions before taking advice.

Although the early removal of malignant growths does not invariably increase the chances of cure, it seems in many cases to prolong life and render it tolerable, particularly when the tumor is excised as soon and as often as it recurs; and in some instances it has been known to postpone recurrence for long periods, if not indefinitely. The citation of a few cases will suffice to illustrate these propositions:

In the year 1877 the writer excised from the chin of a young man a spindle-celled sarcoma measuring one centimetre in mean diameter. The wound healed soundly, and no growth ever recurred in that situation. In about six months a tumor made its appearance in the lumbar regions and was promptly removed, but soon reappeared in the scar; this was also removed, and in the course of two years seven cutting operations in all were performed. At length a newly developed tumor grew rapidly and in a few months attained an enormous size, occupying both lumbar regions, extending to and even encroaching upon the thorax. The patient was then in such an unfavourable condition that further surgical interference was declined, and he soon died. The fatal issue was delayed, probably, by the repeated operations performed as soon as a new growth appeared. The case of sarcoma recorded by Dr. Valentine Mott is a good example of prolongation of life by repeated operations, fifteen of which were performed upon that patient during a period of twenty-three years. Dr. Gross's case of recurring sarcoma is another example of the benefit conferred by early and frequent extirpations—twenty-three in four years—the patient being in good health ten years and four months after the last operation. The writer's case of "giant-celled" sarcoma of the right mammary gland is an additional example of a long period of immunity. The operation was performed in 1874. The disease recurred above the scar, and in 1882 was promptly extirpated. The patient is still in good health, twenty-one years after the first operation.

Ten cases of carcinoma, previously reported by the writer, show an average of a fraction over nineteen years of immu-

nity from recurrence after excision, which was performed during an early period of their development in six cases, and later in four cases. The case recorded in the writer's paper of 1888 as Case V is worthy of a second mention:

The patient, whose left breast was excised for a "scirrhus cancer" twenty years before, sought the writer's advice on account of the appearance of two hard nodules in the old scar. These nodules were excised on the 29th of January, 1885. The wound, after being seared with the thermo-cautery and covered with a layer of cotton, was left to granulate, and was completely healed in four weeks. There has been no sign of recurrence of the disease, and the patient is in excellent health at this date,—ten years and nine months since the last operation. The microscopical examination of the two nodules showed them to be typical carcinomata with a profuse fibrous matrix. In the beginning of 1893 the writer excised a large ulcerated carcinoma of the right mamma, which was threatening the patient's life by occasional profuse haemorrhages. The sloughy, bleeding surface was four inches in mean diameter, and the exhalation therefrom was extremely offensive. The operation was performed with the sole object of preventing death from haemorrhage, but the wound healed primarily, and the patient is now in apparent good health. This is one of the cases of late excision in which recurrence of the disease has not been manifested after more than two years.

That benign and malignant tumors—inomata, sarcomata, and carcinomata—do sometimes exist in the same individual as distinct growths, has been repeatedly demonstrated. Mr. Bryant, of London, records a remarkable example of this occurrence in a woman sixty-four years of age, who was affected with a "lipoma" over the left hip, a carcinoma of the left breast, and a sarcoma of the right breast. He removed the right breast, and in about six months the disease recurred in the scar. In the course of four years and a half from the first operation, sarcomatous growths recurred sixteen times, and sixteen operations were performed for their cure. At last accounts the patient's general condition was good. The "atrophic" carcinoma of the left breast and the "lipoma" of the hip were not excised. May not cases

of this sort be profitably utilised in the study of the question of metamorphosis of tumors? May there not have originally existed, in this case, an adenoma of each breast, one tumor undergoing carcinomatous transformation by excessive epithelial-cell proliferation, and the other undergoing sarcomatous transformation by excessive endothelial-cell proliferation?

It is of prime importance to strive to eradicate from the minds of some physicians the ill-founded opinion that "extirpation of a quiescent malignant tumor only serves to stimulate the extension of the disease." It is likely that this opinion originated from the observation of the bad results of incomplete excision of tumors, or their superficial cauterisation with nitrate of silver, arsenical pastes, or other escharotics, all of which procedures are well known to have this effect of stimulating the extension of the disease; while complete excision removes the whole of the local disease and surely prolongs the period of immunity.

A point worthy of very special consideration in connection with the question of early extirpation of tumors, is the necessity of the clearest conception of the modes of transformation of benign into malignant tumors. If this be well understood, and if it be realised that no time can be fixed precisely when such transformation begins, then the vast importance of early extirpation will be acknowledged and acted upon by all who may have had doubts on this vital question.

Although the recognition of the metamorphosis of tumors dates back to the Galenists, nothing save a vague and irrational exposition of this transformation appears in their, and much later, writings. Attention to this question was recalled by Sir Astley Cooper, who, however, gave no explanation of the conversion of benign into malignant tumors, saying no more than that this change in the character of tumors in women occurred after the cessation of menstruation. It is only since the great advance of embryology and of patho-histology that tumors began to be specialised in accordance with their derivation and structure, and

since the nature of regressive morbid processes began to be better understood, that the right interpretation was given to the metamorphosis of new growths. These preliminary labours have led to the demonstration that an external benign adenoma sometimes receives an accession of leucocytes or of endothelial cells which retain a low organisation, and thus becomes a sarco-adenoma which is malignant; that oftener the leucocytes or the endothelial cells attain a higher degree of organisation, and are developed into fibrous tissue, when the tumor becomes an ino-adenoma which is benign; that in another adenoma there has occurred such an excessive proliferation of embryonic epithelial cells as to break the bounds of the acini and tubes of the diseased gland, thus transforming it into a carcinoma which is malignant; and that a fibrous tumor of long standing may become a sarcoma by a great accession of young cells which retain their dwarfish character. Many examples might be cited of such fibrous tumors excised in the beginning of their transformation into sarcomata. In some of these cases it has happened that the greater part of the tumor was benign, and the remainder malignant. A few months ago, the writer excised from the left cheek of an elderly gentleman, a tumor of about a centimetre in diameter, found to be an adenoma of the sebaceous and sweat glands undergoing epitheliomatous transformation, which involved about a third of its bulk, judging from the extent of the epithelial proliferation. The prognosis is, therefore, favourable, at least for a long period of immunity.

The long time in which some mammary growths remain stationary and apparently harmless, and the final transformation of these tumors into carcinomata or sarcomata, have naturally suggested that they were originally diffuse adenomata, whose existence has, however, been denied by good observers. Since the opportunity has seldom occurred of examining such tumors microscopically, on account of their being very rarely removed during the stationary period, a doubt has existed in many minds whether mammary carcino-



mata or sarcomata can be regarded as metamorphosed, circumscribed, or diffuse adenomata. Although the existence of diffuse adenomata has been repeatedly demonstrated by high authorities in this field of labour, a good additional example may be worthy of record :

Early in November, 1892, a case of mammary enlargement presented itself at St. Vincent's Hospital. The patient, not over twenty years of age, had noticed the gradual and uniform increase of her right breast in the course of a year, the left breast being apparently sound. The writer was asked by Dr. Charles Phelps to see the patient, and agreed with him on the diagnosis of diffuse adenoma, and advised immediate operation. The entire breast was excised, and on careful microscopical examination proved to be a diffuse ino-adenoma, the proportion of fibrous tissue being very slight. Five months afterward, the patient returned on account of uniform increase of the left breast, which was removed by Dr. Phelps, and which also proved to be a diffuse ino-adenoma.

It seems fair to assume that in this case procrastination would have been dangerous, since carcinomatous or sarcomatous metamorphosis is so likely to occur in neglected cases of adenoma.

Careful observations made by independent workers at the bedside and in the laboratory have furnished some of the most important information toward the establishment of the prognosis of malignant tumors, notably that carcinomata containing an excess of fibrous tissue, are less malignant and more amenable to treatment than the so-called encephaloid cancers, which contain very little fibrous tissue, and are developed with great rapidity; that large, spindle-celled sarcomata are less malignant than small, round-celled sarcomata, which are the most malignant of all endothelial growths; and that the lower the organisation of tumors, the greater is their malignancy.

But there remains for examination the question of progression from malignity toward benignity. For the consideration of those who may wish to make further researches into this subject, it is proper to note, that, since benign

tumors, by regression, are transformed into malignant tumors, it is not unlikely that malignant tumors, by progression toward a higher organisation, are sometimes transformed into benign tumors, or at least into tumors which remain quiescent for long periods of time. The behaviour of the so-called "atrophic carcinomata" appears to justify this view. The tumors named "atrophic carcinomata," because of their tendency to decrease in size, to contract like scar tissue owing to sclerous degeneration of their fibrous tissue, are rightly regarded as less malignant than other forms, and often last many years without involvement of lymph-glands or doing any mischief whatsoever. The probable reason why, in these "atrophic carcinomata," the lymph-glands are not implicated is that it cannot be easy for the embryonic epithelial cells to multiply and migrate owing to their being, as it were, imprisoned in the sclerotic tissue. Ulceration only can set them free to diffuse themselves. Thus an adenoma, at the time of greatest proliferation of its epithelial cells, at the very time of its transformation into a carcinoma, may receive an abundant accession of endothelial cells which rapidly progress into fibrous tissue, greater in amount than the epithelial cells, the fibrous tissue soon undergoing sclerous degeneration. Such may be the right explanation of the origin and apparent harmlessness of "atrophic carcinomata." What may be the exact excitant of this progressive metamorphosis and of the subsequent sclerous degeneration, of this effort of nature to effect a cure, has not yet been ascertained. The writer has seen cases of long-standing "atrophic" mammary carcinomata in women up to ninety years old, and believes that, except in feeble and very aged patients, excision of the growth should not be delayed, otherwise the internal organs eventually become involved, particularly after the occurrence of ulceration.

Metamorphosis progressing toward the higher development of the cell element into fibrous tissue, followed by sclerous degeneration, appears to occur also in sarcoma. An interesting example of this sort is under observation :

The patient is an Italian actor, thirty-nine years of age, from whose neck a sarcoma was excised ten years ago. The disease reappeared in the scar, and a second operation was performed about five years ago. In a short time after this second operation a tumor appeared also in the scar, and the case was treated by Dr. Coley with injections of erysipelas toxine for several months. About two years ago the writer was first consulted by the patient, who then had, in the scar of the second operation, a tumor which was so blended with the deep tissues of the neck that it was regarded as inoperable, but likely to remain stationary. The patient returned on the 31st of July, 1895. The tumor then appeared to have decreased in size, but was extremely hard and immovably fixed near the middle of the right cervical region. This man, originally well nourished and stout, was then pallid and emaciated, but no more so than when seen two years before.

The case appeared to be a fair example of transformation of a sarcoma into an inoma with sclerosis of the fibrous tissue. Whether the treatment by injections of erysipelas toxine caused this higher development of the endothelial cells into fibrous tissue, and also caused sclerous degeneration of the newly formed fibrous tissue, or whether these changes were effected by some other excitant, are questions which may be answered only after the analysis of many carefully and long-observed cases. Any treatment insuring the fibrous transformation and sclerous degeneration of inoperable tumors will surely be hailed as a great and marvelous advance in the art of therapeutics.

The following is a brief summary of some of the results of a re-examination of questions pertaining to the frequency, formation, nature, and treatment of certain tumors, as helpful in the establishment of their prognosis:

1. According to the statistics published during the past thirty years, malignant tumors appear to exceed benign tumors in frequency. This is not unlikely to be owing to the fact that benign tumors have not been more generally excised in the early period of their development, but have been allowed to become malignant.

2. While some external malignant tumors were never

benign, it seems that many external benign tumors become malignant, and that some external malignant tumors tend to become benign.

3. It does not seem irrational to regard a benign tumor as potentially malignant, and *vice versa*, since it contains all the essential elements which, perhaps, some accident awakens into activity.

4. The vast majorities of external carcinomata and sarcomata of the mammary glands seem to be developed from diffuse and circumscribed adenomata.

5. The often reiterated dictum that "so long as a tumor is stationary and causes no inconvenience it should not be removed," is contrary to true principles of conservatism and is fraught with the greatest danger to sufferers.

6. The ill-founded opinion that "extirpation of a quiescent malignant tumor only serves to stimulate the extension of the disease," has prevented the early ablation and therefore the cure of many tumors, and is responsible for the great mortality due to procrastination.

7. The early excision of malignant growths does not invariably increase the chances of cure, for there are cases of very small tumors which were promptly removed and which recurred so speedily and soon attained such dimensions as to be inoperable. This is particularly the case with small, round-celled sarcomata and with multiple "melano-sarcomata."

8. The early excision of certain sarcomata and carcinomata very frequently modifies favorably their prognosis, the period of immunity from recurrence of the disease being prolonged sometimes indefinitely.

9. As soon and as often as a tumor recurs it should be excised. Cases illustrative of the good effects of this practise are rapidly increasing in number.

10. The early excision of external benign tumors may often be regarded as prophylactic of malignant disease.

11. Scarcely any tumor is too small to be excised.

12. In the case of a malignant or of a suspectedly malign-

nant tumor, it is imperative to excise not only the morbid growth, but also the apparently normal ambient connective tissue and lymph-glands, to carry the dissection far beyond the diseased tissues, and to take measures likely to insure rapid cicatrisation of the wound.

13. Applications of nitrate of silver, of arsenical pastes, and of other escharotics to many tumors, have generally proved worse than useless, and have been known to excite the rapid extension of the local disease, and in the case of malignant tumors to cause their propagation to the internal organs, leading speedily to a fatal issue.

14. The value of constitutional treatment after the excision of malignant tumors is unquestionably great. This treatment generally consists in the use of reconstituents, and of such other means as may be needed in the endeavour to re-establish and preserve the equilibrium of the bodily functions. None of the internal medicines proposed and given as specifics against malignant cancers have ever been of any service.



## THE EARLY DETECTION AND PROMPT ABLATION OF TUMORS.

By CHARLES PHELPS, M. D., of New York County.

*October 16, 1895.*

My experience for years has been dotted with examples of mortal danger and of death from the development of tumors which had failed of early diagnosis, or in which operation had been procrastinated till hope of relief was lost, or at best but proved delusive. I believe this to have been the common experience of surgeons. Such instances of disastrous delay in the removal of carcinomata and sarcomata have been so frequent and are so notorious, and the lesson which they teach has been so generally accepted, that while the question of the efficacy of bacterial inoculation remains in abeyance, I believe no doubt exists in the minds of practical surgeons as to the necessity of promptitude in action. It is perhaps doubtful whether the same certainty of conviction is felt by the mass of the profession by whom the majority of these cases is primarily adjudicated, but in whose hands final decision more rarely rests. Professional opinion is still more largely undecided as to the propriety of immediate removal of growths, originally benign, which have but slight tendency to degeneration.

It is of the utmost importance that the necessity for early operative interference, if it be established, should be recognised by the general practitioner, who decides at what period the operative surgeon shall be permitted to act upon his convictions. This question should be discussed, therefore, by surgeons as a matter of no less interest to the general profession than to themselves.

For those who believe that all tumors, without distinction of class, should be extirpated at the earliest possible moment

after discovery, diagnosis, beyond the establishment of the fact that a tumor exists, is comparatively unimportant. The determination of its exact character can be made later. For those who adhere to the opinion that only growths of primary malignancy or in which the inherent tendency to degeneration is irresistible, demand immediate operation, early and accurate diagnosis of the nature of the tumor maintains a paramount importance.

It is at once the good and the ill fortune of the advocate of early operation that the argument has been already so exhaustively and conclusively stated by Dr. Gouley<sup>1</sup> in his plea for the early extirpation of tumors, published in 1892, that little opportunity is left for more than reiteration or cumulative illustration.

It has been objected to the ablation of undoubtedly malignant tumors that it stimulates the growth of the disease. This contention seems irrational; if the operation be radical, and the incision made through normal tissues, there is no more reason to believe that the constitutional disorder will be excited to increased activity than if it had been made in some other part of the body, and there is not even ground for suspicion that distant operations in patients suffering from malignant disease occasion new invasions of tissue at their site. It might as reasonably be thought that the resection of tuberculous joints should lead to increased energy of development of general tuberculosis. It is difficult to understand that the relief of any local manifestation should increase the virulence of a general disorder. If the operation for the removal of a cancerous or sarcomatous mass has been necessarily or inadvertently incomplete, there might be reason to inquire whether the local irritation incident to operative interference might not excite more rapid development of the portion which remained. This would be consonant of what we know of the effect of accidental injuries to sarcomata. The answer must be sought in the results of accumulated

<sup>1</sup> "A Plea For the Early Extirpation of Tumors," by Jno. W. S. Gouley, M. D., surgeon to Bellevue Hospital, N. Y., 1892.

experience. An opinion was long prevalent that these were unfavourable to operative interference, whether it were made early or late. It is now recognised that this impression was derived from defective and insufficient evidence.

In recent years more systematic observation, and wider and more careful statistical study, have convinced the best judgment of the profession that sufficiently early operation ensures more or less prolonged immunity from the ravages of the disease in a majority of cases, and in many an absolute freedom from recurrence up to the end of life at its natural limit. It has been made equally evident by the same methods of investigation that the complete extirpation of such growths, even in their period of active development, affords proportionate, if lesser, advantage. This knowledge has led to wider incisions and to the complete removal of glands and lymphatics at considerable distances from the site of disease.

The propriety of the earliest possible intervention in either of these two classes of cases is hardly in question at the present time. The admissibility or advisability of operation in cases in which complete extirpation is obviously impracticable has been less positively settled, and its determination in each case as it arises permits more latitude of individual opinion. It is desirable that this phase of surgical treatment should be more carefully considered, and its results more discriminatingly presented in statistical form. It is probable that many cases which have been reported as affording a favourable result after complete extirpation have been really instances in which operation was incomplete; the inference is at least suggested by details in their histories. It is certain that many tumors are excised without immediate reappearance in which it is positively known that remaining tissues have already become infiltrated with the characteristic cancerous or sarcomatous elements.

In a case of intra-cranial osteo-sarcoma previously reported,<sup>1</sup> which originated in the diploë of the frontal bone, a

<sup>1</sup> Phelps, N. Y. Medical Journal.

portion of temporal muscle incidentally removed was found to be filled with round sarcomatous cells. In a secondary operation some months later there was no extension of disease in this direction. The removed growth had been intracranial though extradural in its origin, and began near the mesian line.

It does not necessarily follow, therefore, that incision through degenerate tissues incites increased energy of development. Such operations at late stages of malignant disease, though often attended by great and even unexpected benefit to the patient, do not justify delay when opportunity permits an earlier interference.

Late operation has its value in the relief of suffering, or possibly in the aversion of an imminent danger; in rendering death less loathsome, and if not too late in affording some chance, more or less remote, of prolonging life. The essential importance of the earliest possible excision of all alien growths, lies in the fact that it replaces the forlorn hope, the desperate chance, of later intervention by a rational prospect of preserving in comfort some substantial fragment of life, if not the whole of its natural term.

It having once been demonstrated, or assumed, that malignant tumors are to be extirpated at the earliest possible moment, the necessity for the immediate removal of those which are benign may be expressed in almost syllogistic form. The possibility that all analogous tumors may become degenerate, is matter of absolute demonstration. No one has ventured to predict the day or hour when the degenerative process is destined to occur, and no one has claimed to recognise, though even then too late, the primal symptoms of the fatal transformation. It is a logical necessity, therefore, if malignant tumors require removal, that safety equally demands the same radical treatment of those other structures which may assume the characters of malignancy even while we hesitate. The stronger the tendency to retrogression, the more imperative the necessity for action. If the slender probability that a lipoma may be transformed,

may justify delay when circumstances are unpropitious, it is no warrant for procrastination when epitheliomata or adenomata with their darker foreshadowing of danger confront us.

It requires some moral courage, some strong conviction of clearly established duty, to condemn to mutilation perhaps young and tender women with diffuse adenomata of the breast, as yet mere inert masses, which, with all their potentialities of evil, may still remain unchanged for an indefinite time to come.

It is probably often less from lack of positive convictions as to the proper course to pursue, than from a hesitancy in action, that such cases of simple tumor are allowed to drift. Under favouring circumstances, one case succeeds another in which no structural change is noted for the possibly lengthened period which observation covers; but eventually, to most of us, comes one so unfortunate in its course and termination that it ends, for at least one particular surgeon, all doubt in which direction duty lies, and all inclination to temporise in the face of such possibilities of disaster. My own lesson from experience was taught and learned not many years ago :

In May, I discovered a small, hard nodule in the breast of a lady of middle age, which was neither tender, painful, nor the source of any sort of inconvenience. It suffered no change during the early summer, and when I last saw her, prior to an absence of two months, I advised her to return in September, with a view to operation. She did not again consult me till December. The tumor was then painful, hard, and inflamed, and the axillary glands were involved. It was an evident sarcoma, and I operated at once. In two weeks' time, small sarcomatous nodules began to appear in the skin of the dorsal region, and were succeeded by similar deposit in the still open axilla. The mammary region, a little later, was also the seat of recurrence. The disease extended in all directions, and she died after prolonged and intense suffering.

I believe this tumor was a simple adenoma through the summer. The circumstances which led me to defer operation were immaterial, and I have not ceased to regret the



delay which resulted so unhappily. It is of course possible that even the earliest intervention might have been unavailing in a case of such marked malignancy, but certainly a chance of safety was allowed to lapse.

In another case, reported at the same time with the intracranial osteo-sarcoma to which I have already adverted, the danger of prolonged inaction was even more clearly demonstrated.

A laryngeal epithelioma existed for nearly three years. At the first examination it was pronounced to be of innocent character, and the patient, a physician, rested content until it had nearly filled the larynx and after an emergent tracheotomy consented to its removal, and died shortly afterward from resulting pulmonary complications. Subsequent examination of the tumor by eminent histologists showed that the degenerative process had but recently commenced.

It is useless to multiply such instances, which may be supplemented in the experience of every surgeon. The argument and the result of experience so absolutely concur that the conclusion seems irresistible that all accessible tumors, in the absence of positive contra-indications, should be removed without hesitation, and without regard to their structural character, whether innocent or malign. The surgeon requires courage to act upon his convictions, and resolution to discard considerations of sentiment which so readily suggest excuses for delay, while malignant growths are yet inert, or those which are benign give no token of impending change. It may be easier to make action follow quick upon decision when the peril is imminent, but duty is no less urgent when danger seems remote. It may be necessary to be cruel in order to be kind, for thus only "out of the nettle, danger, we pluck the flower, safety."

## MEANS OF ERADICATION OF TUMORS—THE KNIFE VERSUS CAUSTICS.

By PARKER SYMS, M. D., of New York County.

*October 16, 1895.*

The proposition contained in the above question is one so generally conceded that I might almost leave my subject with the simple statement that ablation by means of excision is the only proper way of dealing with operable malignant growths; but the subject is worthy of very full consideration.

It is impossible to properly set forth the reasons for this assertion without trespassing on the domain of the others who partake in this general discussion. For it would be necessary to carefully consider the nature, the modes of propagation, and the histological character of these tumors; the necessity of early detection and prompt ablation of these growths, and the importance of their complete extirpation, and of rapid cicatrisation of the wound, and other important points, each of which has been assigned to an able exponent.

To avoid thus trespassing, and yet to define my position, I must state the following dogmas:

1. That malignant neoplasms are the result of some special cause—probably a bacterium.

2. That the development of a malignant growth is frequently caused or determined by a local or exciting cause, as a traumatism.

3. Though the bacterium or special cause may exist, disseminated through the body, or in the blood of the patient, it produces no effect till it has caused the formation of a neoplasm.

4. That the infection is at first a purely local condition confined to the site of the growth.

5. That general infection of the subject is caused by distribution from the original local focus.

6. That if this infection be completely eradicated while it is still localised, the patient may be truly cured.

7. That the lymphatic system is the principal channel through which distribution from a malignant growth occurs.

8. That when the growth is situated in an organ whose anatomical arrangement admits of complete removal of itself and of its lymphatics, the results following operation are the best.

Accepting these statements as true, it will be seen that the following conditions are necessary for the satisfactory, complete, and surgically correct ablation of a malignant growth:

1. The thorough removal of all the visible disease.

2. The thorough removal of all the invisible disease, hence the removal of a zone of apparently healthy tissue surrounding the growth.

3. The removal of as much of the lymphatic system as comprises the direct efferent apparatus of the region involved.

4. The removal of the disease *en masse*, as far as possible, so as to avoid cutting into it and liberating the productive elements, which would favour local infection.

5. The preservation of the patient's strength, as far as possible, hence the avoidance of pain, shock, and prolonged healing processes.

6. The ablation of the disease in its earliest stages.

How can these objects be best accomplished? Most decidedly by means of a well-performed, aseptic, surgical dissection, and not by means of a distinctive inflammation, however induced. Let us contrast the advantages of the one with the disadvantages of the other.

1. As regards the removal of the visible and invisible disease: We can never be sure of the extent of the infiltration of the tissues till we have exposed them to the senses of sight and of touch, and it is not usually practicable to decide

before operating how much tissue must be removed. All know how useless it is to remove only the perceptible growth, and that when this alone is done how surely there will be a continuance of the disease at the original site. By a careful dissection of the part we can be sure of removing the desired amount, if it be possible to do so. In the use of caustics we lose the advantage of sight and touch as guides to the extent of the disease, and the intelligence of the operator is substituted by the supposed chemical affinity between the caustic and the neoplastic tissue. The proceeding has all the uncertainty of guesswork.

2. Concerning the removal of the essential lymphatics: A careful study of the regional anatomy of the commoner sites of malignant tumors will show at once how impossible it would be to remove the lymphatic apparatus of an organ or region by the use of caustics. The lymphatic ducts are, for the most part, located in the areolar tissue. The glands, which are the usual sites of earliest secondary growths, are in all instances in close anatomical relation with the important blood-vessels of the part, and only by the most careful and accurate dissection can they be removed without serious, perhaps fatal, damage to these important structures. That it would be impossible to accomplish this by means of chemical agents goes without saying.

3. Concerning the removal of the disease *en masse*, and thus the avoidance of local infection: Taking for granted the two statements concerning the modes of propagation of malignant tumors, namely, that they are the result of some such special cause, as a bacterium, and that the disease is at first a local one confined to the site of the tumor, it must be acknowledged that it is very important to avoid cutting into the mass while *in situ*, or so opening it up as to establish a direct communication between the healthy and the diseased structures. This is especially true of encapsulated sarcomata. Of course dissection is the only means by which we accomplish this desired object. A destructive caustic, so applied as to reach the borders of a neoplasm, makes a con-

tinuous, open wound, involving the diseased and the healthy tissue, and establishes a means of most direct communication between the two.

4. Concerning the conservation of the patient's strength, etc.: An aseptic surgical operation, properly done, upon a suitable subject, is comparatively free from shock, and the healing process is brief and painless. The destruction of a tumor of any considerable size by means of a caustic is an attack of severe illness in itself, and after enduring pain and torture the patient must pass through a tedious convalescence.

5. Concerning the ablation of the disease in its earliest stages: Of course the mere element of time consumed is the factor here. The surgical operation is a matter of a few minutes. The destruction of tissue by caustics requires repeated applications and involves a serious loss of time.

There is one very important consideration which I have not included among the foregoing; that is, the advantage of the knife over caustics in avoiding disfiguring and disabling deformities. While it is always necessary to remove so much tissue as to be sure to include a zone of healthy tissue with the diseased, it should ever be our aim to avoid unnecessary mutilation of the patient, and as far as possible to preserve his natural appearance, and also to destroy, as little as possible, the function of the part involved.

By the use of caustic paste the destruction is wide-spread on the surface, as compared with the deeper plans, and restitution is accomplished by the process of healing which makes the most extensive scarring. Removal of a tumor by a classic operation produces the least possible deformity, and the operator is able to conserve the function of the part as far as is possible; important structures are spared when they are not involved, and plastic operations, or, when necessary, skin-grafting, reduce the deformity to a minimum.



## THE NECESSITY OF COMPLETE EXTIRPATION OF TUMORS, AND THE IMPORTANCE OF RAPID CICATRISATION OF THE WOUND.

By FREDERICK HOLME WIGGIN, M. D., of New York County.

*October 16, 1895.*

Neoplasms occur with greater frequency in the female than in the male subject. Statistics show that the breast, next to the uterus, is the most usual site of these morbid changes, seventeen per cent. of all cases occurring in the former and nineteen per cent. in the latter. Williams<sup>1</sup> found in a collection of 13,824 primary neoplasms, 2,397 cases in which the female breast was affected, while only 25 similar cases were found to exist in males. We may, therefore, with propriety limit ourselves in considering and answering the questions of the necessity of complete extirpation of tumors, and the importance of the rapid cicatrization of the wound, to the neoplasms of this region in the female. It may be well once more to call attention to the fact that malignant growths occur in all parts of the body more frequently than do those which are benign. According to Williams, ninety-five per cent. of all breast neoplasms are malignant.

This preponderance of malignant tumors, coupled with the fact that at times benign neoplasms take on malignant characteristics, proves at once the fallacy of the wide-spread belief, which, contrary to the teaching of Gouley and others, still continues to exist in the minds of many general practitioners, that as long as a tumor remains quiescent it is unwise to remove it. This idea undoubtedly originated in the dread

<sup>1</sup> W. Roger Williams, F. R. C. S., Diseases of the Breast.

which surgical procedures, undertaken for the relief of these morbid conditions, inspired in the minds of both patient and physician, partly on account of the high rate of mortality which formerly followed them, and partly because they seldom afforded even temporary relief to the sufferers. We can hardly wonder that these patients, failing to receive encouragement that their condition could be materially benefited by drugs or operative measures, should either do nothing, or should, in their despair, turn towards the charlatan in the vain hope that possibly he could in some degree make good his promises of cure.

While undoubtedly this was a true statement of the results of the treatment employed by physicians a few years since, it is by no means a fair representation of the case to-day, and it is the purpose of this paper to show why the older surgeons so often failed in their treatment of this class of cases, and the methods by means of which so much better results are obtained with certainty to-day, and the surgeon enabled to hold out hope, if not of cure, of long periods of freedom from the disease.

The most frequent cause of death following these operations in the past was septic infection, but, thanks to the discoveries of Pasteur, and their adaptation to surgical practise by Lister, and the changes which have finally ended in the aseptic technique of the present day, the mortality following these operations has been reduced from twenty-five per cent. to practically none.

Said Dr. J. W. S. Gouley, in the course of a discussion on tumors before this Association in 1888, "From a scientific point of view it cannot be said that malignant neoplasms are ever cured, since it is known that their tendency to recur is strong and that the period of their recurrence is indefinite." But it is a well-established fact that after three years have elapsed, the tendency to recurrence is slight, and for the purposes of this discussion this period of immunity will be considered as the test of success of the methods employed by the surgeon.

Formerly, when it was customary to remove only the tumor, the results were unsatisfactory, and few surgeons succeeded in giving their patients this period of immunity. If we accept the cellular theory of the genesis of neoplasms, it can be readily understood, as has been pointed out by Williams, that these lesions are seldom limited to their starting-point. Sir Astley Cooper, in the course of his lectures on surgery published in 1839, page 386, said,—“I would observe that the scirrhus tumor is not all the disease. There are roots which extend to a considerable distance, and if you would remove the tumor only and not the roots, there will be little advantage from the operation.” Again, the same author, in his lectures on surgery published in 1821, Lecture XXI, page 251, in describing the technique of the operation of excision of a mamma containing a malignant tumor, said,—“Let both the incisions be carried down to the pectoral muscles, and dissect out the tumor close to the latter, so as to lay it completely bare, removing even the fascial covering, for if this be not minutely attended to, there will be a very great probability of the disease returning or, I may say with propriety, remaining.” Again, “The glands in the axilla, if enlarged, are now to be cautiously removed, together with the intervening substance, as leaving the latter would be the future cause of a similar disease being produced.”

In 1866, Charles H. Moore, F. R. C. S., in his paper entitled “On the Influence of Inadequate Operations on the Theory of Cancer,” *Medico-Chirurgical Transactions*, Vol. 50, page 245, said,—“When any texture adjoining the breast is involved in, or even approached by, the disease, that texture should be removed with the breast. This observation relates especially to skin, to lymphatics, to much fat, and to pectoral muscles. The attempt to save the skin which is in any degree unsound, is, of all errors, the most pernicious, and whenever its condition is doubtful that texture should be freely removed. In the performance of the operation, it is desirable to avoid not only cutting into the tumor, but

also seeing it. No actually morbid texture should be exposed lest the active microscopic elements in it be set free and lodge in the wound. Diseased axillary glands should be taken away by the same dissection as the breast itself, without dividing the intervening lymphatics; and the practise of first roughly excising the central mass of the breast, and afterwards removing successive portions which may be of doubtful soundness, should be abandoned. Only by deliberately reflecting the flaps from the whole mamma, and detaching it first at its edge, can the various undetected prolongations of the tumor and outlying nodules be included in the operation. To parts not capable of removal it is desirable to apply chloride of zinc."

It would appear that Sir Astley Cooper was the first to recognise the fact that the disease was not confined wholly to the mamma where it originated, that in cases of scirrhus tumors of this region, the axillary and infra- and supra-clavicular glands early become infected and enlarged, and should be removed, that the incision should be made wide of the disease and down to the pectoral muscle, and he advocated the removal in all cases of the pectoral fascia. He called attention to the fact that the reappearance of the disease is often not a true recurrence, but a "remaining" or continuance of the disease. In other words, the operation has been an incomplete and, therefore, unsuccessful one, when after a short interval the disease reappears locally and cannot be considered a re-infection. Had he left out the words "if enlarged" in his advice to clear out the axilla, little would have been left for the so-called originators of the modern complete operation to discover. In these views Moore coincided, reiterating the importance, (1) of the complete removal of the diseased organ; (2) of the necessity of cutting so wide of the disease that none of it should appear in the course of the operation; and (3) the removal in one mass of all the tissues, including a liberal margin of apparently healthy skin.

Notwithstanding this sound and brilliant teaching, surgeons

continued to perform partial operations only. Dr. Curtiss, in the course of his article entitled "The Cure of Cancer by Operation," *Medical Record*, February 24, 1894, said,—“Gross found in those cases subjected to operation in which the site of recurrence is noted, that in ninety-six cases operated upon without touching the glands, the disease reappeared in the cicatrix or vicinity alone in forty-eight per cent., in the axillary glands alone in twenty per cent., and in both in thirty-two per cent., returning in the glands in fifty-two per cent. of the cases. On the other hand, in 313 cases in which the axilla was cleared the percentage of recurrences was seventy-five locally, twelve in the glands, and thirteen in both, a reduction of the glandular recurrences from fifty-two per cent. to twenty-five per cent.”

These statistics showed the importance of including the axillary glands in the tissues to be removed. But Kuster was probably the first to prove that the glands may be infected and therefore a source of continuation of the disease before they begin to enlarge. Volkmann called attention to the fact that the loose areolar tissue between the glands and the pectoralis major muscle contains glandular off-shoots and lymphatics, which in malignant cases are diseased. Heidenhain proved that these lymphatics may adhere to the fascia without penetrating it, and that there is not free communication between them and the lymphatics of the muscle. With the recognition by Volkmann, Banks, Gross, Bull, Dennis, and others, of the importance of these views and their practical adoption, came a marked diminution in the percentage of the recurrences, or, more properly speaking, continuations of the disease, the cures amounting to about twenty per cent. Bull has lately, in the course of an article entitled "The Cure of Carcinoma of the Breast by Radical Operation," *Medical Record*, Vol. 46, page 225, stated his individual results to be 26.6 per cent. Dennis, in his article entitled "Recurrence of Carcinoma of the Breast," read before the American Surgical Association in 1892, stated that twenty-five per cent. of the cases of carcinoma of the breast operated upon



by him had passed the three-year limit without recurrences, and subsequently, at a recent meeting of the Litchfield County (Conn.) Medical Association, "That in eighty-three per cent. of his last fifteen cases three years or more had elapsed without a recurrence of the disease," and that in those cases which were operated on by him within six months of the appearance of the disease, cures had been secured in all cases.

Volkman, in a few of his worst cases, excised the pectoral muscles as well as the other tissues ordinarily removed by him. This addition to his technique was followed by results more satisfactory than his previous ones. The disease reappeared in only thirty-five per cent. of these cases, against sixty per cent. in those cases in which the muscles were left intact. Halsted, acting on this suggestion, has for some time included this procedure in his operations for the removal of carcinomatous mammae, with apparently wonderful results. He states the so-called recurrences to be only six per cent. in the cases operated on by him from June, 1889, to January, 1894; but in many of these cases sufficient time had not elapsed when his paper was written to make the test either a fair or satisfactory one.

Professor W. H. Welch, in the course of the discussion previously alluded to, held before the Litchfield County Medical Association, confirmed the necessity of this addition to the technique; for he said, "that frequently microscopical examinations of the pectoral muscles in cases in which there was no appearance of cancerous deposit, showed a plugging up of a lymphatic by a group of several cancer cells." "Therefore," he said, "the rule for cutting wide of the disease has the very best foundation in microscopical examination." He also added "that a carcinoma was always unquestionably a malignant tumor, but microscopical examinations of sarcomata did not allow one to speak with the same assurance as to the malignancy of these tumors. Thus, sarcomata which were made up of small, round cells, with very little basement substance, were most malignant tumors ;

on the other hand, the spindle-cell sarcomata might be localised, and never give rise to metastasis."

By a complete operation, then, is meant one that not only removes the entire mamma, and all the skin that surrounds it, but the axillary glands and those contained in the infra- and supra-clavicular space, as well as those that lie between the edges of the pectoralis major and deltoid muscles, the loose areola tissue underlying the gland, and the fascia covering the great pectoral muscle; and if more than six months has elapsed since the detection of the primary neoplasm, the pectoral muscles as well. The incision being carried wide of the diseased tissues, these are removed in one mass, thus avoiding the danger of the dissemination of cancerous fragments in the wound, the smallest particle of which is sufficient to form a nucleus for a recurrence, or continuation, of the disease.

Halsted, Mayer, and Curtiss report that but little deformity and functional disturbance follow the extirpation of the pectoral muscles, major and minor.

There can be, at this time, little doubt that the reason of the failure of the older surgeons to obtain satisfactory results was due, in the first place, to septic infection, and in the second place, to late and incomplete operations. The remedy seems at present to lie largely in the hands of the general practitioner, as well as in those of the surgeon; for, as we have seen, much depends on the promptness with which the operation is advised and performed. Too much stress cannot be laid on the importance of the complete extirpation of neoplasms, for upon the thoroughness with which this is accomplished depends the cure, or interval of immunity from the disease. To the question, of what importance is the rapid cicatrisation of the wound, it may be answered, that while it is of consequence that every wound should heal as rapidly as possible, in the cases we have been considering it should be deemed a matter of secondary importance to the free removal of the tissues adjacent to the diseased structures. The rapid healing of the wound may be promoted

by skin-grafting, according to the method of Thiersch, or by Schede's method of the organisation of the blood-clot.

With a better understanding on the part of the general practitioner, of the necessity for the early extirpation of all neoplasms, especially of those of the mammary region, and on the part of the surgeon, of the vital importance of the complete operation, it seems reasonable to expect that in the near future the surgeon's art will triumph over this mortal foe of womankind, and that a reasonable hope of cure can be confidently offered to those afflicted with this most malignant of diseases.

## THE VALUE OF SUBSEQUENT CONSTITUTIONAL TREATMENT, AND THE LONG SURVEIL- LANCE OF EVERY PATIENT AFTER THE OPERATION.

By FREDERICK S. DENNIS, M. D., of New York County.

October 16, 1895.

The value of subsequent constitutional treatment in the management of malignant disease, is a question that is still *sub judice*. There has been no unanimity of opinion among surgeons upon this question. Some believe that great value is to be placed upon constitutional treatment, while others who speak with equal authority, consider that such treatment is absolutely valueless. The *practical* surgeon should not adopt this latter view, even if he can not fully endorse the former. In other words, he should give the benefit of the doubt to the patient. There have been some very remarkable cases reported in which it is claimed that malignant disease has been held in abeyance by the persistent and long-continued use of certain constitutional remedies, such as arsenic, bichloride of mercury, chian turpentine, Lugol's solution, pyox-tannin, gold, etc. Dr. Jarvis Wight, of Brooklyn, has published some interesting and valuable statistics upon the benefits to be derived from the use of constitutional remedies. His results are such as to entitle him to the respect of the entire profession. There are other surgeons who have published results that offset the statistics of Dr. Wight and others.

The writer feels fully convinced, after a careful statistical and clinical study of the question based upon a large experience in the management of several hundred malignant neoplasms, that there is little to be expected from the administration of constitutional remedies, and that in those cases

in which no return of the disease follows an operation on patients on whom constitutional remedies have been employed, the result is due more to the radical character of the operation itself than to the beneficial effects of any specific drug.

If there is any good effect produced by internal remedies, it is due to the fact that the drug has acted in the form of a tonic which has improved the general nutrition of the patient, and, in consequence, enabled him or her to offer a greater resistance to the advance of the disease itself. In other words, that no constitutional remedies have a specific action upon malignant neoplasms, like iodide of potash, for example, in syphilis. At this juncture naturally this recent question is pertinent, as to whether iodide of potash has any specific action upon sarcoma. The writer has notes of a few cases where patients with supposed sarcoma of internal organs have improved under large doses of iodide of potash. It is always an open question, in such cases, whether the so-called sarcoma was not after all a gumma. Again, the writer has seen a general improvement in the health of a patient suffering from cancer, with a slow subsidence of the tumor itself after a prolonged treatment by constitutional remedies.

These cases are surgical curiosities, and are rather to be explained by a process of atrophy analogous to cirrhosis of the liver. Some remarkable cases of spontaneous disappearance of tumors have been recorded by men who speak with the weight of great authority.

The spontaneous disappearance of tumors from the body has been observed by several authorities. Dwight reports a case of complete subsidence of a pelvic tumor, in which abscess was eliminated, and gumma was excluded by the administration of iodide of potash.

Sands also reported a case of a large tumor of the left groin, which completely disappeared, so that at the autopsy no trace of the tumor could be found, except a super-abundance of connective tissue. Esmarch has reported cases of recurring fibroid tumor disappearing under the use of iodide of potash.



Duhring reported a case of inflammatory fungoid neoplasm, which involved the chorium, which tumor spontaneously disappeared. Coats presented specimens before the Pathological Society, of London, in which Sir James Paget remarked that "the report of such a case was useful, as likely to help in the explanation of those rare instances in which tumors diagnosticated to be cancerous had disappeared after a time." Three cases of this kind were observed by Sir James Paget.

Fisher has shown that certain tumors have been known to disappear spontaneously, in consequence of some serious illness, or if not to disappear, at least to become greatly reduced in size. Among these tumors he mentions sarcoma, adenoma, and lymphatic enlargements.

Cheever reports twelve cases of miscellaneous tumors that disappeared either spontaneously, or as the result of the administration of potash, iron, arsenic, and bichloride of mercury.

Although there is some reason to believe that tumors proper may disappear spontaneously, the fact remains that they very rarely do so, and such inference should only be drawn where the diagnosis has been established beyond question and the subsidence has been complete; or, if partial, that it was not of some complicating inflammatory enlargement. It should be always borne in mind that the more chronic a case of scirrhus cancer, the more does it undergo cicatricial contraction. This contraction must not be considered in connection with spontaneous subsidence or disappearance.

The long surveillance of every patient, after the operation, is a part of the discussion assigned to the writer that appeals to him most forcibly. The treatment of tumors will never be placed upon a scientific footing until this routine is carried out in every case. No one can estimate the importance of this subject until he has begun to collect data with a view to establish some facts in regard to the curability of malignant tumors.

In order to have a surveillance of a patient, it is of the

first importance to begin aright at the start. In the first place there should be taken a full and succinct history of the patient, which report should be coupled with a good photograph of the tumor. In the next place, there should be attached to the history a written report of the microscopical examination of the tumor, and a full account of the extent of the operative procedure should also be preserved. At the conclusion of this primary report, it is a useful plan for the surgeon to place in writing his impressions of the future history of the case.

In the second place, the history of the patient should be noted after an interval of six months, and, if at the time of this examination there is any evidence of a return of the disease, it should be stated where the return of the disease is, or what organs are involved. If the recurrence is regional, it can also be marked upon the photographs.

The writer has for the past few years made notes in this way in cases of malignant disease. He has kept up the surveillance of the patient while Dr. Dunham has furnished written reports of the examination of any recurrent nodule. If the practical surgeon will work in conjunction with a practical pathologist, much valuable information in regard to tumors is sure to be forthcoming.

The clinical history and the microscopical examinations must be kept together in a tangible, but methodical, form, and after the lapse of a few years a flood of light is sure to be thrown upon this obscure subject. The question of following up the patient's history is a perplexing one. The writer knows of no way except an appeal to the patient for his or her own good, with the assurances that in all probability a cure can be effected by commencing before the disease has spread, and that an examination every six months, or at least a year, will make certain a good prognosis. This instruction should be coupled with a distinct understanding that in the event of any return of the disease, at any time, the patient is to seek the surgeon immediately.

Three years is the standard of time accepted by surgeons

to indicate a permanent recovery after the removal of malignant tumors. There are only two per cent. of cases in which a recurrence follows after three years from the date of the operation. It is in the two per cent. of cases that a long surveillance will enable the surgeon to establish some useful facts. It is, in regard to the treatment of malignant tumors, evident that the three years' limit is too short to exclude the possibility of a recurrence; but, as it answers in about ninety-eight per cent. of the cases, this standard has been accepted by those who have tabulated statistics.

The long surveillance of a case is illustrated by a patient from whom the writer removed a cancer of the breast, with the axillary glands, six years ago, and for five years there was no evidence of any return of the disease. At the expiration of the fifth year a tumor appeared, not in the cicatrix, but in a gland high up near the subclavian artery. The tumor was excised, and a return occurred in the femur, and the patient died within nine months from the appearance of the recurrent nodule.

The writer knows of another case in which a central sarcoma was removed from the head of the tibia, and fourteen years after the amputation, the patient died from sarcoma of the viscera.

Many cases like the two mentioned could be cited to show the necessity of long surveillance of these patients, since reliable data can only be obtained by such a method of investigation. The long surveillance of a patient with malignant disease is often rewarded with success; for example, the writer knows of a case of cancer of the breast in a patient whose mother died of the same disease. The patient enjoyed immunity for nine years, at the expiration of which time the disease returned in the cicatrix, and now nearly three years have expired with no return.

The writer has now under observation a case in which over one hundred cancerous nodules have been removed, and the patient is now, and has been for some little time, free from the disease.

The history of such cases demonstrates the fact that our ultimate knowledge as regards the treatment of malignant disease can only be reliable after a long surveillance of the cases. If the members of this Association will carefully record the clinical history of neoplasms and obtain photographs of the tumors, and keep a long surveillance of their cases, it will not be long before the profession will be in possession of fixed data in reference to every tumor.

# THE VALUE OF SUBSEQUENT CONSTITUTIONAL TREATMENT, AND OF LONG SURVEIL- LANCE OF EVERY PATIENT AFTER OPERATION.

By E. D. FERGUSON, M. D., of Rensselaer County.

*October 16, 1895.*

On viewing this question, both by direct and side light, the first impression that came to me was the complete inability to indulge in any enthusiasm over triumphs in this field of professional work. It is a fact, that as a profession, our pride has fattened on the conquests made during recent years in our medical Dark Continent, and to such a stature has our mutual admiration grown, that it may be well to be required to pause before an unsolved problem,—to be brought to a realising sense that we have not conquered the universe, and that problems await us, the clue to the solution of which is still unknown.

The question requires a consideration from two stand-points, *i. e.*, from the therapeutical and the detective points of view.

When we recall recent as well as ancient history, and see the folly connected with the claims for cundurango and chian turpentine, we can properly conclude that our prescription paper may as well remain blank in the interests of our unfortunate clients, at least so far as direct effect in modifying constitutional conditions to the prevention of relapse is concerned. On the other hand, we may find something useful to do and to prescribe if we eliminate the idea that in pursuing “constitutional treatment” we are directing our agents against a special contamination, as in syphilitic cases, and consequently need specific agents.



Malignant tumors are not all cancers. Hence the fact, which I believe is at present undeniable, that we are unable to control or materially modify the course of cancers by the administration of drugs, does not preclude the possible and even probable benefit in other forms of malignant tumors. This has special reference to the occasional beneficial influence of arsenic on those sarcomas that seem to be somewhat related in location to the superficial or cutaneous lymphatic apparatus, and by inference would justify the post-operative administration of that drug when the primary operation has shown such a tumor.

But having thus frankly confessed our weakness in the line of direct assault, and inferentially our feebleness even in defense, there still remains the problem of providing for such conditions as may lessen the local tendency to recurrence—and right here there seems to be a field for actual work.

While waiting for more positive evidence as to the causation of cancers and other malignant tumors, swayed now by the claims of those who uphold the efficiency of the inclusion of embryonic cells in alien localities, and at another time thinking we can *almost* see the malign influence of some form of protozoa, we can at least perceive one point clearly, and that is, that certain portions of the body are specially liable to irritation, and also specially liable to cancer. The relatively frequent occurrence of malignant disease in the lips and tongue, at the pylorus, rectum, uterine cervix, and in the breasts of women, is sufficient evidence in support of this statement. By analogy it is proper to conclude that whatever plan will diminish local irritation may contribute to the prevention of recurrence. All details as to special measures to promote such protection, whether mechanical or medicinal, must manifestly be left for selection in individual cases, and will vary according to the parts involved and the sources of irritation.

There is one therapeutical line worthy of mention, and that relates to the promotion of the general health, thereby

securing better nutrition of all the organs and parts of the body. It is needless to specify means or measures for such a purpose, for it implies a wide range of disorders, and consequently varied plans of management, so once more we can pass on without reference to particular articles of the *materia medica*.

The second division of the question remains to be answered, *i. e.*, the value "of long surveillance of every patient after operation," and here it seems manifest that useful work can be done, provided operation is had only in cases that admit of some hope of permanent benefit.

It is now accepted that a cure is often secured in malignant tumors by early operation, whereby the offending part is removed, together with such of the surrounding tissues as may have been permanently influenced by the malign neighbour, though still wearing the garb and maintaining the appearance of sound membership in the body's economy. This principle is applicable to recurrent tumors in those instances in which we have failed to secure all the tissues that should have been removed. If the area of recurrence is so situated as to allow efficient excision, then operation is to be advised exactly as in a primary case, and other things being equal, there will be an equal chance of success.

About five years ago I removed a cancerous breast, together with the axillary fat and lymph structures, but a recurrence within a few months at the scar over the site of the primary tumor showed the lack of thoroughness in my work at that point. However, a thorough excision of this new focus (for it would become a *focus* if allowed to remain) resulted in a cure now tested by the lapse of nearly five years.

This second operation was the outcome of my instructions to the patient to present herself occasionally for inspection, and to come at once for examination if she observed anything unusual or that she could not explain in the involved area.

This one case could be multiplied in the experience of

most surgeons, so that there is a shade of rosiness in our view of the question in spite of the sombre appearance at the beginning, but then it is only an exception after all to the general rule,—that much remains to be discovered in the prevention of a fatal issue by recurrence.

# THE MANAGEMENT OF CASES OF RECURRENT TUMORS, AND THE INDICATIONS AND CONTRA-INDICATIONS OF REPEATED OPERATIONS.

By STEPHEN SMITH, M. D., of New York County.

*October 16, 1895.*

Of the various theories in regard to the intimate nature of tumors, by writers on pathology, two have been generally recognised as more accurately explaining all of the phenomena of their origin and development.

1. Virchow includes all hyperplasias and inflammatory or granulomatous formations among the tumors. This classification is based on his "cellular pathology," which teaches that "each species of tumor, whatever it may be, answers, in its important parts, to the elements of the body the type of which is known, and the capital difference among divers tumors resides in this—that tissues normal in themselves appear under the form of a tumor, sometimes in regions where this tissue normally exists, sometimes in places where it does not exist in the normal state of things.

2. Cohnheim entirely excludes the inflammatory and granulomatous enlargements, and contends that a tumor is "an atypical new formation starting in a latent embryonic rudiment." The tumor germs consist of embryonic cells which may have long lain dormant in the system. From these cells "a tumor takes its rise in what we might call a belated rudiment—a focus of formative embryonic tissue, which has not been utilised in elaborating the normal tissue of the part."

Though these two theories differ widely as to the histogenesis of tumors, they agree in the important practical

conclusion that every tumor has its origin in preëxisting cell tissue. Virchow says,—“We must completely abandon the idea that a tumor can develop itself in the body as an independent being. It is a part of the body; it is not merely contiguous to it, but proceeds from it, and is subject to its laws. The laws of the body also govern the tumor. This is reason why it is not an object of natural history that one can regard as foreign to the elements of the body; it is, on the contrary, to be looked upon as embraced within its limits.” According to Cohnheim’s theory, a tumor has its origin in an embryonic cell which has not been utilised in the development of the normal tissues of the part, but has remained in its original embryonic state until aroused to activity by some exciting cause. This parent cell of the neoplasm may have lingered for a long time inactive. It is only when it was favoured by the proper external conditions—as the supply of nutriment, and the relation to surrounding tissues—that it began to multiply and form a tumor.

These two theories establish important practical conclusions, which greatly aid us in this discussion. It appears (1) that every tumor is developed from a preëxisting cell, or cells, by proliferation; (2) that a tumor is not an independent being, but is a part of the body, and is subject to the laws which govern the body.

The mere statement of the preceding conclusions would seem to indicate very clearly the proper management of any and every accessible tumor. Common sense dictates that the only rational method of eradicating a growth that has its origin in a germ is to destroy the germ itself. And such is now the universal practise of surgeons. The necessity of the “early extirpation of tumors” of every kind and nature, has been admirably and convincingly discussed in the able and exhaustive paper of our colleague, Professor Gouley, published in the ninth volume of the Transactions of this Association.

But the question which has been raised in this discussion



is as to the "indications and contra-indications of repeated operations" in cases of "recurrent tumors." This statement suggests the inquiry,—How does a "recurrent tumor" differ from the primary growth? In the language of some pathologists,—How does the "Daughter tumor" differ from the "Mother tumor"?

The answer is not difficult to make. The "recurring tumor" may appear at the site of the original tumor, or in some remote region of the body. If it appear at the site of the primary tumor all pathologists agree that it has its origin in the germs of the mother tumor, which were not destroyed by the preceding operation, whatever that operation may have been. The consensus of opinion of authorities on tumors in regard to the recurrent growths which appear at a distance from the site of the original tumor is not less emphatic as to their relation to the primary growth. They teach us that this method of recurrence "implies a secondary neoplastic eruption, resulting from the transmission of the elements of the original or parent tumor to a remote part of the body, and the development of a daughter tumor from these germinal elements." These germs of the parent tumor are conveyed to other regions through the lymphatics or blood vessels, and hence the recurrence may be in lymphatic vessels and glands which receive the infected lymph, or in remote organs irrigated by the infected blood.<sup>1</sup> By whatever method the transmission may have been made we learn that,—“The development of the daughter tumor unquestionably starts from these transported germs. This is probable from the fact that the metastatic, or secondary, tumor, has always the same structure as the primary.”

While, then, we are dealing with the same elements in the secondary tumor as in the primary, the further question will arise,—Does not the recurrence of a tumor indicate a tendency to malignancy, and if so, would not that fact modify the indication of treatment of the secondary growth? The

<sup>1</sup> Ziegler.

answer to that question will depend upon our definition of the term "malignant" as employed in pathology. If we adopt the older theories that malignancy depends upon some peculiar and undefinable "dyscrasia," some specific elements quite foreign to the tissues of the body, and, hence, governed by laws of development of which we are ignorant, except, perhaps, that where we find these elements we are convinced that a fatal issue will result, whatever treatment we pursue, we are justified in the conclusion that no secondary operation is advisable in recurrent tumors. But if, on the contrary, we are guided in our practise by the light of modern science, and recognise in the recurrent tumor only the repetition of the growth which we had attempted to extirpate, root and branch, instead of allowing it to grow without "let or hindrance," we should attack it more vigorously, and employ every new method which, in the experience of others, promised success. The fact that the tumor recurs would be regarded as proof that the former operation was not sufficiently radical and far reaching. Nor would the fact that the tumor appeared in a distant region of the body deter him from resorting to extirpation, but would rather stimulate him to the use of more radical and extensive operations. The surgeon who scientifically, as well as conscientiously, treats a "recurring tumor," will attack it whenever and wherever it reappears, with knife, or other destructive agent, as long as it is possible without sacrificing the life of the patient.

Nor will the surgeon adopt this radical and aggressive course of treatment of "recurrent tumors," without ample evidence of final success. The records of surgery abound with cases of the complete triumph of "repeated operations" of "recurrent tumors." A patient of my own had a sarcomatous growth of the shoulder removed eleven times, the first operation having been performed by Dr. Valentine Mott. The eleventh operation consisted in amputation at the shoulder joint. That patient is still living, in good health, twenty years after the last operation.

The conclusion which the preceding facts justify as to the management of cases of "recurrent tumors," is tersely stated in the paper of Professor Gouley, already mentioned, as follows:

*As often as a tumor recurs, it should be removed, so long as there is any possibility of cicatrisation of the wound, even by skin-grafting.*

# THE INDICATIONS FOR NON-OPERATIVE LOCAL TREATMENT OF TUMORS; THE VALUÉ OF TOXINES.

By W. B. COLEY, M. D., of New York County.

October 16, 1895.

*Mr. President and Members of the State Medical Association :*

I wish to thank you for the honour conferred upon me by asking me to open the discussion upon the "Therapeutic Value of Toxines in the Treatment of Inoperable Malignant Tumors." This is a subject in which I am deeply interested, and one that has occupied no small part of my time during the past four years. In the brief time at my disposal I shall attempt no explanation of theories, but set forth as clearly and concisely as possible the most important clinical facts derived from a careful study of nearly one hundred cases of inoperable malignant tumors treated with the mixed toxines of erysipelas and bacillus prodigiosus.

These cases extend over a period of four years, and they embrace nearly every variety of sarcoma and carcinoma. In practically all of the cases the diagnosis was confirmed by microscopic examination made by the most competent pathologists. In addition the majority of the tumors had been pronounced inoperable by leading surgeons, and if still further evidence were needed to establish their malignancy such evidence is furnished by a history of repeated recurrence.

Surely from this series of cases sufficient data should be forthcoming to enable us to reach some scientific opinion as to the value or worthlessness of these toxines in the treatment of malignant tumors.

The first point I wish to discuss is, Have these toxines any antagonistic or beneficial action on malignant tumors ?

The second point is, In what varieties of tumors is this action most marked? The third and most important point, Is this action permanent in character or merely temporary?

An analysis of the cases shows that 66 were sarcoma, 28 carcinoma, 4 sarcoma or carcinoma, 2 tubercular.

Of the cases of sarcoma, about one half showed more or less improvement. The variety that showed the greatest improvement was the spindle-celled sarcoma, and that which showed the least was the melanotic sarcoma. Next to the spindle-celled in the order of benefit was the mixed-celled (round- and spindle-celled), then round-celled, while osteo-sarcoma closely approached the melanotic in showing but little effect from the toxins.

In a series of six cases of melanotic sarcoma no improvement was observed in three cases, and but very slight temporary improvement in three others. It should be observed, however, that in three of these cases the tumors were multiple and the disease thoroughly generalised before treatment was begun; yet in the other cases the antagonistic action was so trifling that were it not for the fact that at least one case of melanotic sarcoma has been cured by accidental erysipelas, there would be little to encourage one to further try the toxins in this class of cases.

In osteo-sarcoma the results are scarcely more satisfactory. Most of the cases showed slight improvement, and one case of very large osteo-chondro-sarcoma was apparently cured and remained well for nearly a year, and then recurred. Further treatment caused temporary improvement, but he is now getting worse, and a fatal termination will undoubtedly occur. This case is very important on account of the size of the original tumor. The fact that it recurred after it had been apparently cured only renders the diagnosis more certain.

*Round-celled sarcoma.*—In one case, small round-celled sarcoma of the neck, of very rapid growth, a tumor the size of an orange was reduced to the size of a hen's egg in one week after three injections of the mixed toxins. No further reduction took place, and in spite of large doses of the tox-



ines, the tumor again began to increase rapidly in size and caused death within three months.

In many of the other cases of round-celled sarcoma the improvement was very striking, but in no case of purely round-celled tumor did a cure result. One case of mixed, round, oval, and spindle cells disappeared, and the patient is alive and in perfect health nearly three years after treatment. (This case was shown to the members of the Association.)

I should add, however, that the case that led me to take up this line of investigation was one of small, round-celled sarcoma of the neck, which had been operated upon by Dr. William T. Bull five times, at the New York hospital. The last operation was performed in 1884. It was found impossible to remove all of the tumor, as it surrounded the deep vessels, and the patient was given up as hopeless. A few days after the operation the patient had a severe attack of erysipelas, followed by a second attack shortly after the first had subsided. The tumor tissue entirely disappeared during the course of the erysipelas, and I found the patient alive and quite free from disease in 1891, seven years after.

*Spindle-celled and mixed*—celled sarcomata apparently respond best to beneficial action of the toxines, and all of my own successes have been in these varieties.

*Carcinoma* (including epithelioma.)—I have thus far been extremely conservative in advocating the toxines in anything but inoperable sarcoma, though I have been steadily working upon carcinoma. My results in carcinoma, while far from ideal, are still such as to encourage us in the belief that we are working along the right lines, and that at no very distant day we shall attain some measure of the success that has been already achieved in the treatment of sarcoma. This opinion is shared by no less an authority than Sir Joseph Lister. The by no means inconsiderable number of cases of demonstrated carcinoma that have been permanently cured by accidental erysipelas, would seem to lend additional weight to this view. I believe that we have in the toxines, nearly, if not quite, all of the virtues that exist in the living

germ, and in a form that enables us to make use of them without risk to the patient. Doubtless further experiments will lead us to modify our present method.

I have seen very marked improvement follow the injection of the toxins in a considerable number of cases of carcinoma, and in two cases the tumors disappeared, and the patients are still well, one a year and three months after beginning of treatment, and one year after cessation of treatment, and the other seven months after treatment. (Both of these cases were epithelioma.) A third case of rapidly growing, twice recurrent carcinoma of the breast, in which a large gland, the size of a hickory nut, encircling the axillary artery high up, was left at the last operation, February, 1895, has shown marked benefit from the use of toxins.

The recurrent mass in the cicatrix was  $1\frac{1}{2}$  by  $2\frac{1}{2}$  inches in April, 1895, and was growing rapidly. The pectoral muscle was infiltrated and hard. The injections have been made from two to three times a week since that time, with the following result:—The recurrent mass in the scar was much diminished in size; the hardness in the pectoral has greatly decreased, and the gland in the axilla cannot be felt. The general condition of the patient has likewise improved. This case is not mentioned as even a probable cure, but simply to show, in a striking manner, the influence of the toxins upon a rapidly growing recurrent carcinoma. Until further improvement in the technique of the method has been attained, and until I have had cases remain well for a period of at least three years, I shall not recommend the toxins in carcinoma, and then, it is unnecessary to say, only in inoperable cases.

Now, in regard to the third point in the discussion, and the one that deserves the most consideration: Is the beneficial action of the toxins upon sarcoma permanent—that is, really curative? This point can, I believe, best be answered by giving you an opportunity to see and examine a number of the cases that have remained well for a considerable length of time. I shall first read you brief histories of these cases.

## A TWICE RECURRENT INOPERABLE SARCOMA OF THE NECK WITH LARGE SECONDARY SARCOMA OF TONSIL.

CASE I.—Treated with repeated injections of living cultures of erysipelas for four months. Well four years after treatment. The patient had been operated upon twice by Professor Durante of Rome, and last by Dr. W. T. Bull at the New York hospital in March, 1891. The tumor of the neck was so large that only a portion could be removed, and the general condition of the patient when I began treatment, May 4, 1891, was so bad that he was expected to live but a short time. The tonsil tumor was so large that it was impossible to swallow solid food, and liquid food was taken with difficulty. From May 4 to October, 1891, I treated the patient with repeated local injections of living bouillon cultures of the streptococcus of erysipelas. No attack of erysipelas occurred until October, yet improvement followed the injections, and whenever they were discontinued the growth increased in size.

On October 8 a severe attack of erysipelas followed the injection of a new and more virulent culture. During this attack the tumor of the neck nearly disappeared, the tumor of the tonsil decreased in size, and the general condition of the patient rapidly improved until he had regained his usual health and strength. He has had no treatment since October 8, 1891, and he is at present in good health. He has been repeatedly examined by myself and other surgeons since. My last examination, made in September, 1895 (less than a month ago), showed a small mass at the site of the old scars upon the neck, apparently made up of cicatricial and fibrous tissue. It had remained unchanged for four years. The tumor of the tonsil was still present though it had apparently shrunk some in size, and the features of malignancy must have been either entirely lost or in complete abeyance. The general condition was excellent. The patient himself has just sailed for Europe, but a photograph taken in September, 1895, four years after treatment, will show you his present condition.

[Copy from Records, N. Y. H. Laboratory.]

SPEC. No. 1870.

(Zoli.) Mic. Ex. and Report.

“Operation, a piece of tumor about the size of an orange was removed, but a portion yet remains, being too deeply seated for extermination.”

"Microscopically the tumor is composed of fibrous tissue and spindle cells, the fibrous tissues predominating in places and in others the spindle cells.

"There are many areas of cells resembling mucous cells, and not to be differentiated from myxomata; vascular supply abundant and vessel walls formed by tumor tissue."

Diagnosis, "myxo-sarcoma."

DR. FRANK FERGUSON,

*Pathologist to the New York Hospital.*

LARGE RECURRENT SARCOMA OF THE BACK AND GROIN.—ENTIRE DISAPPEARANCE OF BOTH TUMORS.—PATIENT IN PERFECT HEALTH WITHOUT RECURRENCE THREE AND ONE HALF YEARS AFTER THE BEGINNING AND NEARLY THREE YEARS AFTER THE CESSATION OF TREATMENT.

CASE II.—This patient was a male, aged forty, with a sarcoma of the back (lower lumbar region) 7x4 inches, with a secondary tumor the size of a goose egg in the groin. The groin tumor had been removed in January, but rapidly recurred. The patient was examined by Dr. William T. Bull, who regarded the case as inoperable sarcoma. The same diagnosis was made by a number of other surgeons. The tumor was photographed by Dr. George H. Fox, and a section was removed under cocaine and examined by Dr. Farquhar Ferguson, pathologist to the New York hospital, and the diagnosis confirmed. For a fuller history of this case I will refer you to my published papers. I will simply state that treatment was begun in the erysipelas wards of Bellevue hospital in April, 1892, and that daily local injections of living bouillon cultures of erysipelas were given for two weeks before an attack of erysipelas was produced. The attack was very severe, but during the attack and the few succeeding days both tumors entirely disappeared. Recurrence followed in July, and both tumors grew more rapidly than before. The injections were resumed, and between October, 1892, and January 1, 1893, he had four additional attacks of erysipelas, but mild in character.

In December, 1892, he was exhibited before the surgical section of the Academy of Medicine. The influence upon the tumors was striking, but less marked and more temporary than the first attack. In January, 1893, I removed the recurrent back tumor but left the groin undisturbed. After three weeks there was an apparent recurrence in the back, and I began using the toxic products of

erysipelas and bacillus prodigiosus, injecting them locally into the groin tumor. This preparation was the one made by filtering the toxines through porcelain. The two toxines were mixed at the time of using.

The tumors quickly disappeared. The injections were discontinued in March, 1893, and the patient has been in perfect health ever since. You will have the opportunity of examining him, and will see that he is entirely free from recurrence.

[Copy from Records, N. Y. H. Laboratory.]

PATHOLOGICAL REPORT.

"The tumor is a sarcoma, in which the cells are round, oval, and spindle, in which everywhere there is seen a stroma of fibrous tissue, apparently the remains of the subcutaneous tissue which has not been completely destroyed during the development of the tumor. Yellow elastic fibres are quite abundant throughout the tumor, but the vascular supply is not very abundant."

FRANK FERGUSON, M. D.,

*Pathologist to New York Hospital.*

LARGE INOPERABLE SARCOMA OF THE ABDOMINAL WALL AND PELVIS.—ENTIRE DISAPPEARANCE OF TUMOR.—NO RECURRENCE TWO YEARS AND NINE MONTHS AFTER.

CASE III.—This case, a boy sixteen years of age, was pronounced inoperable by Dr. L. Bolton Bangs, at the time professor of genito-urinary surgery at the Post-graduate Hospital. A section of the growth was removed and pronounced spindle-celled sarcoma, by Dr. H. T. Brooks, the pathologist to the hospital. Dr. Bangs referred the patient to me for treatment with the toxines, and he was admitted to the New York cancer hospital in January, 1893. He was treated for nearly three months with the mixed filtered toxines of erysipelas and bacillus prodigiosus. At the end of this time the tumor had nearly disappeared, and the little that remained was gradually absorbed after the injections were discontinued. There was no breaking down, and the entire growth disappeared by absorption. The original growth was 7x5 inches in extent, involved apparently the entire thickness of the abdominal wall, was attached to the pelvis, and from symptoms and position evidently involved the bladder wall. The boy's general condition improved with the disappearance of the tumor, and he has enjoyed.



the best of health ever since. (Case exhibited to the Association.)

PATHOLOGIST'S REPORT.

"Spindle-celled sarcoma."

[Signed] H. T. BROOKS,  
*Pathologist Post-Graduate Medical School and Hospital.*

LARGE INOPERABLE SARCOMA OF THE ABDOMINAL WALL.—ENTIRE  
DISAPPEARANCE.—NO RECURRENCE TWO YEARS AFTERWARDS.

CASE IV.—This patient was a woman twenty-eight years of age. An exploratory laparotomy had been performed at the Massachusetts General Hospital, by Dr. Maurice H. Richardson, in August, 1893. The growth was found too extensive to permit of removal, and the wound was closed. A portion of the tumor was removed, and examined by the pathologist to the hospital, Prof. W. F. Whitney of the Harvard Medical School. The diagnosis was "Fibro-sarcoma."

The patient was sent to me by Dr. Richardson, in October, 1893, for treatment with the toxines. Local injections of the mixed filtered toxines were given for six weeks; then, after an interval of one month, they were given for four more weeks. At the end of this time only a slight induration remained at the site of the tumor. A few weeks later this also had gone away, and the patient is still in perfect health two years after, without a suspicion of hardness in the region of the tumor.

In the discussion of my paper before the American Surgical Association, in June, 1894, Dr. Richardson, in reference to this case, said,—

"In this case there was no doubt, according to accepted methods of diagnosis, that the woman had a malignant and necessarily fatal disease. The mass filled the right lower quadrant of the abdomen when I operated. I first incised in the median line and came down on the tumor. I then made an incision in the lateral region, with the same result. There was nothing to be done surgically. I took out a section and had it examined. It was pronounced sarcoma. The patient was sent to New York in October. When she came back there was a little induration about the scar. In May there was not the slightest sign that could be detected.

Unless the diagnosis was entirely wrong; unless the history, gross appearance, and microscopic examination were entirely wrong, this was a case which must have died sooner or later."

DR. WHITNEY'S REPORT.

August 31, 1893.

The specimen from the tumor of the abdominal wall (Mrs. Lord) was a small, dense, illy-defined, whitish, fibrous-looking mass which on microscopic examination was found to be made up of large numbers of small cells with a tendency to form fibres. This latter condition was more marked in some places than others. The diagnosis is fibro-sarcoma.

W. F. WHITNEY,

*Pathologist to the Massachusetts General Hospital and Instructor in Pathology and Histology at the Harvard Medical School.*

SARCOMA OF THE LEG AND POPLITEAL REGION THREE TIMES RECURRENT.—DISAPPEARANCE.—FREEDOM FROM RECURRENCE IN ONE AND ONE HALF YEARS.<sup>1</sup>

CASE V.—This patient, a girl of fifteen years of age, had undergone three operations at the New York Hospital, by Dr. William T. Bull. The tumor was a spindle-celled sarcoma, originally starting in the metatarsal bone. A Syme's amputation was performed in 1890. Six months later local recurrence appeared in the stump, quickly followed by a second tumor in the popliteal space. In January, 1894, the tumor in the popliteal region was the size of a child's head, and the one in the stump the size of a hen's egg. This large tumor, or as much of it as was possible, was removed by Dr. Bull in January, 1894, but the smaller one was left undisturbed in order to try the effect of the toxines.

The toxines were given at the New York Hospital under Dr. Bull's direction, for about two months. The tumor of the stump entirely disappeared, and the patient gained seventeen pounds. She was afterwards transferred to my service at the New York Cancer Hospital and the injections continued for a time. The indurated mass in the calf slowly disappeared and the patient is to-day in good health. There is slight suspicion of recurrence on the outer aspect of the stump. The treatment has been resumed

<sup>1</sup>Recurrence in stump and buttock occurred the latter part of October, 1895. The case is again under treatment. That there was a suspicion of it in the stump at the time the case was exhibited was pointed out.

from time to time the past year, but only small doses were given.<sup>1</sup>

#### PATHOLOGIST'S REPORT.<sup>2</sup>

Tumor the size of a child's head, measuring  $9 \times 7 \times 4\frac{1}{2}$  centimeters, partly surrounded by a smooth capsule, but presents many freshly incised surfaces; whitish in colour; very firm; of little vascularity; and presenting the appearance of fibro-sarcoma.

Microscopic examination of the tumor shows the typical structure of a fibro-sarcoma, with sarcoma elements predominating; vascular supply fairly predominant.

FRANK FERGUSON,  
*Pathologist, New York Hospital.*

SARCOMA OF THE SCAPULA INVOLVING A LARGE PART OF THE LEFT HALF OF THE THORACIC WALL.—ENTIRE DISAPPEARANCE OF THE TUMOR UNDER THREE MONTHS' TREATMENT.—PATIENT AT PRESENT IN PERFECT HEALTH, WITHOUT RECURRENCE FIFTEEN MONTHS LATER.<sup>3</sup>

CASE VI.—For a full description of this case, I refer you to my earlier paper.<sup>4</sup>

The patient was a girl aged sixteen years, and admitted to the incurable ward of the New York Cancer Hospital, June 20, 1894. The tumor began in the region of the left scapula, four months before, and at the time the treatment was begun the growth extended to the vertebral line behind, measured thirteen inches vertically, extended around beneath the axilla to the sternum in front. The growth was firmly fixed to the scapula and to the ribs. It was about two inches in thickness in the scapular region. The skin over it was perfectly normal and movable. The left arm was so bound down by the new growth that it could not be raised to the horizontal position. The general condition was much impaired. The mixed unfiltered toxins were injected locally in the scapular portion of the tumor, and continued, with occasional intervals of one or two days, for three months. The improvement was immediate and very striking.

After three weeks the arm could be raised to a vertical position, and in October, 1894, after three months' treatment, the tumor had

<sup>1</sup> Case exhibited before Association.

<sup>2</sup> Copy of Record, Pathological Laboratory, New York Hospital.

<sup>3</sup> Case perfectly well, December 14, 1895.

<sup>4</sup> Medical Record, January 19, 1895.

entirely disappeared by *absorption* only. The patient has had no treatment since, and is at present in perfect health.<sup>1</sup>

PATHOLOGIST'S REPORT ON SECTION REMOVED FROM SCAPULAR PORTION OF TUMOR.

"Spindle-celled sarcoma."

H. T. BROOKS,

*Pathologist to N. Y. Post-Graduate Hospital.*

INTRA-ABDOMINAL SARCOMA OF MESENTERY AND OMENTUM.—APPARENT DISAPPEARANCE.—EXAMINATION UNDER ETHER ONE YEAR LATER FAILED TO DETECT TUMOR.

CASE VII.—This patient, female, aged twenty-three years, was operated upon by Dr. Willy Meyer, at the German Hospital in August, 1894. A tumor was found in the right hypochondriac region, apparently starting in the mesentery, but involving the omentum and attached to the liver.

Removal was considered impossible, and the wound was closed. Examination of a portion of the tumor, which was excised for diagnosis, showed the growth to be "spindle-celled sarcoma," and in September, 1894, Dr. Meyer kindly sent her to me for treatment with the toxins. She was treated with injections of the *mixed, unfiltered toxins* in the abdominal wall and buttocks for about six months, occasional intervals of rest being allowed.

When she came under my care she had a sinus at the centre of the abdominal incision. This has remained open up to the present time, although two attempts were made under ether to explore the sinus, the last in September, 1895. The incision was carried down to the peritoneum, yet even then it was impossible to detect the presence of any tumor. The patient is in perfect physical health, and is at present engaged in housework.

PATHOLOGIST'S REPORT.

Spindle-celled sarcoma.

EPITHELIOMA OF THE CHIN, LOWER JAW, AND FLOOR OF MOUTH.—INOPERABLE.—PATIENT WELL WITHOUT RECURRENCE ONE AND ONE HALF YEARS LATER.<sup>2</sup>

CASE VIII.—This patient, a woman thirty-four years old, was admitted to the Methodist Episcopal Hospital, in May, 1894, with a rapidly growing tumor involving the central portion of the lower

<sup>1</sup> Case exhibited before the State Med. Association, October 16, 1895.

<sup>2</sup> No recurrence, December 14, 1895.

jaw, the floor of the mouth, and the soft parts of the chin. There was an area the size of a silver half dollar upon the chin, which was the seat of a typically epitheliomatous ulcer. A portion was removed and pronounced by the pathologist epithelioma. The tumor had a history of four months' growth. Dr. Fowler regarded the case as inoperable and without hope. He stated that the only operation that could be done would be removal of the lower jaw, floor of mouth, and a part of the tongue; that the risk of death from the operation would be great, and that recurrence within a few months would be almost certain. Dr. Fowler referred the patient to me for treatment with the toxines. In view of the tumor being epithelioma I gave a very bad prognosis, but promised to try the injections.

She was admitted to the New York Cancer Hospital, in June, 1894, and was treated with *mixed toxines unfiltered* (B. Prodigiosus and S. erysipelatosus) for about ten weeks. The injections were made into the chin and repeated daily as a rule. In three weeks the ulcerated area had entirely healed, and the diseased portion in floor of mouth had greatly improved.

In September, 1894, the patient had become very much run down from the long-continued injections and severe reactions, and two small ulcers one fourth inch in diameter appeared in the chin. She was sent home to recuperate. Her only treatment since that time was the administration of tonics and local application of electricity to the chin for a short time by Dr. Sarah V. Burnette. I saw the patient in May, 1895, in perfect health, without any trace of tumor being found.

I had a photograph of her taken October 7, 1895, and I am also able to present for your examination to-day, the patient herself one and a half years since the beginning of treatment. No indication can be detected in the scar nor in the floor of the mouth, and the patient is in perfect health.

#### PATHOLOGIST'S REPORT.

Material from chin and lower jaw, May 20, 1894. Sections were not entirely satisfactory, but from gross appearance of the materials and those revealed by the microscope the diagnosis of epithelioma is offered.

[Signed] BELCHER.

Dr. Fowler, in a later letter enclosing the pathologist's report, states,—“While I am sure that the case was one of



epithelioma, judging from the clinical standpoint, and based upon the history of its rapid growth as well as its recurrence upon removal, yet I am fully aware that epithelial findings, from every standpoint, should be absolutely beyond question. Dr. William N. Belcher, pathologist to the Methodist Episcopal Hospital, and member of the Brooklyn Pathological Society, made the report, and in a letter explaining his report he states,—‘The fragments were frozen by the use of the carbon-dioxide apparatus, and free-hand sections made. Notwithstanding the unsatisfactory picture revealed by the microscope, there seemed to me to be sufficient to warrant the opinion that the material was of an epitheliomatous character. Upon consulting the hospital records, I find that the diagnosis of epithelioma was made by the operating surgeon, presumably prior to my report, and it would seem to me to be as nearly correct as any diagnoses can be, all opinions being liable to mistake.’ ”

This case is presented as fairly as possible, and the profession may form its own judgment as to its value. I may add that I venture the opinion that no surgeon who has had much experience in malignant disease would have been convinced that the tumor in question was other than *malignant*, even if the microscopic examination had been entirely negative. There are certain tumors, in which clinically the diagnosis is impossible, and there are others in which the clinical features are so strikingly characteristic of malignant disease as to render the diagnosis as certain as one determined by the microscope.

I have not time to refer to the cases that have remained well for less than one year. In the near future all of my cases will be published in detail, together with photographs of the tumors and micro-photographs of the most important sections.

I will state that two of my previously reported cases, in which I believed there was reason to hope for a cure, have recently relapsed. One case was a five times recurrent sarcoma of the hand, which had remained well for one year

after treatment with the toxines. The other was the very large osteo-chondro-sarcoma of the ilium, which disappeared under the injection, and recurred seven months later. A third case of sarcoma of iliac fossa was lost sight of at the end of one year, at which time he was in good health.

The criticism of Dr. Senn,<sup>1</sup> to the effect that since others have been unable to obtain the same good results as myself the method is of little value, may be answered in a word. Dr. Senn's criticisms were based upon a study of nine cases, three of which were carcinoma, and three of the others types of sarcoma which I have expressly stated were but slightly influenced by the toxines. This leaves but three cases, which are manifestly too small a number to enable one to formulate a scientific opinion upon the value of the method. Moreover, he states that the toxines used were obtained from *three* different sources. There have been at least six successful cases in this country treated by this method. Two of these cases have been published in the *Medical Record*, and I have personal histories of the others.

I have already called attention to the very great difficulty, both in obtaining suitable cultures and in keeping them sufficiently virulent.

The toxines are very powerful bacteriological products, and need to be used with the utmost care to be free from risks. I have myself had two cases, in which death was undoubtedly hastened by the injections. In one case the patient was so weak and emaciated that no treatment should have been attempted. But a single injection of a very small dose was given. A moderately severe reaction followed, and death from exhaustion occurred the third day.

The whole subject is still in the experimental stage. I have only advocated the method in *distinctly inoperable* cases of sarcoma, as a last resort. Even in such cases, I do not believe it would be wise at present to advise its general use by the profession at large.

I believe enough has been accomplished to demonstrate

<sup>1</sup> American Medical Association, May 9, 1895.

that a *real* and *positive* step forward has been made in a field that up to now has resisted every attack of medical science. In order to give you an idea of what is the opinion of medical men abroad upon these investigations, I may be permitted to quote the following :

Répin, of Paris, in an elaborate article on "Toxitherapy of Malignant Tumors," in the *Revue de Chirurgie*, June, 1895, says,—“ We believe toxitherapy constitutes a resource that is not to be despised, at least in certain cases of inoperable tumor, and that it produces at least temporary improvement, checking the progress of the tumors, and offers some chances of radical cure if the treatment is followed with energy and perseverance.”

In the *Müncheuer Medicinische Wochenschrift*, September 3, 1895, Czerny describes his experience with the treatment of malignant tumors by injections of mixed erysipelas and bacillus prodigiosus toxines in eight cases.

Although the influence of accidentally contracted erysipelas in cases of carcinoma has, in his experience, usually been a negative, or distinctly adverse, one, he recalls two instances in which the effect of the erysipelas was distinctly beneficial. One of these occurred in a woman who had undergone seven operations at the hands of three surgeons for carcinoma of the breast. She applied to Czerny for the eighth operation. As the chest wall was thoroughly infiltrated, he advised against operation, but at her request he dissected away as much of the growth as possible—leaving a wound as big as a saucer, with a carcinomatous base. Erysipelas set in, and the patient was brought to the edge of the grave. The cancerous nodules disappeared, and in eight weeks the wound was completely healed. Two years later the patient died, apparently of broncho-pneumonia, her health in the meantime being good.

At the autopsy, the chest wall and axilla were absolutely free from cancer, but the right lung contained many cancerous nodules, which were considered to be the cause of death.

The other patient had undergone two operations for cancer of the breast before Czerny saw her and removed recurrent nodules. Erysipelas followed, and six years later there was no further recurrence of cancer.

Czerny's experience with the toxins began in May, 1895. He has treated eight cases, four of sarcoma and four of carcinoma, making use of a mixed culture of erysipelas and prodigiosus sterilised by heat. (Coley's method). The most marked effect was in the following case:

Mrs. B., thirty-five, had for five months a rapidly growing tumor of the right parotid region, extending back of the ear, giving complete facial paralysis of that side, and having reached, at the time the injections were begun, the size of a man's fist. It was firm, nodular, and ulcerated in places, and had the clinical appearance of an infiltrating carcinoma of the parotid region. Microscopically it was found to be a small, round-celled sarcoma, containing scattered typical nests of epithelium and pearls. In six weeks eighteen injections of the toxins were made, with marked constitutional symptoms—pains, chills, and fever up to 40.40 C. (105° F.)

At this time the facial paralysis had nearly disappeared, the parotid had become soft, and the infiltrating tumor had dwindled to three soft nodules, movable in the skin, and all measuring about an inch and a half by half an inch.

Czerny considers this case an illustration of the favourable, almost specific, influence of the toxins on a malignant tumor; but does not consider it an absolute proof, since the patient at the time of treatment was pregnant, and similar tumors often disappear in part after confinement.

(Sarcoma epulis, fibro-sarcoma of the abdominal wall. Osteophytes of the skull.)

The case was still under treatment at the time of the report.<sup>1</sup>

The other cases of sarcoma were handled only a short time, and showed only slight change.

<sup>1</sup> In a recent personal letter, Czerny states that the case was still improving and could be easily removed.

The four cases of carcinoma were treated without benefit, except that in one case—a carcinoma of the upper jaw of wide extent—after eighteen injections the tumor was softer and the subjective condition had improved.

The author closes as follows:

“As already said, the material is too scanty and has been handled for too short a time, to permit of the deduction of rules for the treatment of malignant tumors. None the less, the fact that many tumors are favourably influenced by erysipelas toxines seems to me so important that it appears desirable to test this influence in every way. If it comes to pass that many tumors, otherwise incurable—as, for instance, the sarcomata—can in this way be treated methodically and cured, that of itself will be a great gain; and an insight into the other malignant growths will also be won, although doubtless considerable water will flow down the valley of the Rhine before this thousand-year riddle of the sphinx is solved.

“However, these injections of sterile mixed cultures are of the greatest interest from a general pathological point of view, and grouping my limited experience with the much wider experience of Coley and others, I draw the following conclusions:

“1. The sterile, unfiltered, mixed cultures of erysipelas and prodigiosus when injected in minute quantities, produce a rapidly rising temperature, often with chill, gastric symptoms, dizziness, and delirium; sometimes with herpes labialis, but usually without local inflammatory symptoms. The intensity of these symptoms depends on the individual, on the amount of the dose, and finally on whether the fluid enters the lymph spaces or the blood vessel. (Répin.)

“2. These symptoms subside in a few hours without permanent effect upon the general condition. After the injections have been many times repeated, there appears anorexia, emaciation, anaemia, and malaise.

“3. The injections are capable of exercising a specific influence on sarcomata, which, under favourable circumstances, they may cure. (Coley.)



"The tumors become oedematous, and then simply shrivel up and are absorbed, or else, softening, necrosis and sloughing of the tumor tissue takes place.

"4. As the results are still wholly uncertain, this method of treatment cannot take the place of operation, much less become preferable to it. For the present it is to be employed only in cases of inoperable or recurrent tumors. Perhaps after operation for sarcoma it may be used to guard against recurrence.

"5. In carcinoma the injections produce at most a delay in the growth, but no cure."

NOTE.—I am greatly indebted to Mr. B. H. Buxton, Director of the Loomis Laboratory, and Assistant Pathologist to the New York Cancer Hospital for most valuable aid in preparing the toxines.

## OBSERVATIONS ON PELVIC CONTRACTIONS.

By AUSTIN FLINT, JR., M. D., of New York County.

*October 16, 1895.*

Contractions of the pelvis in which the deformity is marked occur but rarely, and are always easy to recognise. Contractions of a minor degree, however, occur very frequently, and the diagnosis is often very difficult. To prove that this is true, I have analysed six thousand cases of confinement with reference particularly to the diagnosis, the frequency with which contractions occur, and, if possible, to draw some general conclusions in regard to prognosis and treatment.

The influence which even a moderate degree of contraction has upon labour is not entirely mechanical. So many other conditions must be taken into account, such as the size and compressibility of the foetal head, a faulty presentation or position, or a prolapse of the cord, due often to the existence of contraction, that rules for treatment cannot be based on measurements alone. A pelvis with certain diameters may in one case permit the spontaneous delivery of a well-developed child, and a pelvis with the same diameters may in another case demand operative interference, often of a serious nature. Such examples are frequently met with and are difficult to explain. I have, therefore, not attempted to fix upon any exact measurements under which all pelvises are strongly contracted, and over which all pelvises are moderately contracted, but shall take all cases together, remembering, however, that the vast majority belong to the latter class. In the first place, I may define what I have called "contraction," explaining at the same time the methods of diagnosis.

As it is rare, if not impossible, to find two pelvises with the

same diameters throughout, some standard must be fixed separating the normal from the abnormal. In describing the size of a pelvis, we speak of the distance between the spines and crests of the ilia, the external conjugate diameter, which is measured from the fossa beneath the spine of the last lumbar vertebra to the middle of the upper border of the symphysis in front. The diagonal conjugate diameter extends from the lower border of the symphysis to the promontory of the sacrum. The true, or obstetrical, conjugate, is the distance between the promontory and a point on the inner surface of the pubis just below its upper border. All of these diameters can be measured accurately, with the exception of the last, which must be calculated from the diagonal conjugate. I have not considered as contracted, pelves in which the distances between the spines and crests of the ilia alone were diminished. In all cases in which these measurements were very much below the normal standard, the other diameters were also diminished. When the normal proportion was disturbed, that is, when the distance between the spines was as great as, or greater than, the distance between the crests, a diagnosis of rachitis was made, and in these cases the other measurements were usually found to be abnormal. This leaves but two diameters which must be measured,—the external and the diagonal conjugates. The true conjugate is the more important, and is the one which is designated in defining the degree of contraction. The method of determining the true conjugate is to subtract from the diagonal two thirds to three fourths of an inch, or, in my experience, even more, this depending on an estimate of the height and inclination of the symphysis and the position of the promontory. The personal equation,—the individual skill and experience of the examiner,—enters so largely into the determination of this diameter, where a difference of even one fourth of an inch is of the utmost importance, that it seemed to me safer, in collecting cases, to rely on the diagonal and external measurements, which can be determined exactly.

We owe much of our knowledge of pelvic deformities to the investigations of Litzmann, and I have followed as nearly as possible the limits as defined by him. The same limits have been adopted by all the German observers whose reports I have been able to examine or have seen quoted. Litzmann places in the class of contracted pelvis all cases in which the external conjugate measures 18 c. m. or less, or 7.2 inches. I have taken only pelves with an external conjugate of 7 inches or less. For the true conjugate, he places the limit at  $9\frac{1}{2}$  c. m., or 3.8 inches. I have adopted a diagonal conjugate of  $4\frac{1}{2}$  inches or less, which, reduced to the true conjugate, would make  $3\frac{5}{8}$  inches for the largest by the subtraction of only  $\frac{2}{8}$  of an inch.

The statistics which I have to present will be better understood if I first explain briefly certain details of the manner in which they were obtained. The records are from the written histories of six thousand consecutive cases of confinement, cared for by the Society of the Lying-in Hospital of the City of New York.

A woman applying for care during confinement is first subjected to a thorough physical examination, including careful pelvic mensuration. At this time the history of previous confinements, an examination of the urine, and other minor details are inquired into and recorded on a blank which is called a pregnancy sheet. This is numbered and filed away until the onset of labour, when it is taken out, brought to the case, and is finally bound with the record of the labour and puerperium, making a complete history of that individual case. If, at the time this "ante-partum examination" is made, there exists any abnormality, it is first verified by one of the resident staff, or the attending physician on duty, and a special "abnormality blank" is filled out and filed, thus guarding as far as possible against error.

A consideration of the class of patients from which these observations have been obtained is of interest. Comparing ordinary hospital statistics with statistics obtained from private practise, it is natural and usually correct to assume

that complicated and difficult cases come to the hospitals; and, therefore, abnormalities including contractions occur more frequently in institutions. In my statistics, however, the patients are all "out-door cases" of the poorer class, attended in their own homes, and thus fulfil more exactly the conditions met with in ordinary private practise. In other words, they represent as nearly as is possible the actual average condition. It is only recently, since the figures here presented have been analysed, that an in-door service has been added to the hospital.

I have looked over the pregnancy sheets of these 6,000 cases and noted the confinement number of each one in which the external conjugate measured 7 inches or less, and the diagonal conjugate  $4\frac{1}{2}$  inches or less. Contractions were noted in 654 of the 6,000 cases, or in 10.9 per cent.

In round numbers, the frequency of contractions in Germany is said to be 14 per cent. The report from Leopold's clinic for 1895 gives 610 cases out of a total of 2,512, or 24.3 per cent., nearly one quarter of all cases. This is the largest proportion in any report that I have seen. Schwarz, in Göttingen, reports 20 per cent.; Spiegelberg, 14 per cent.; and 16 per cent. is reported by Müller from the clinic at Berne. As, however, the Lying-in Hospital in New York is often called upon to treat premature cases and abortions, which are entered in the history numbers among these 6,000 cases, it would be more exact, in computing the frequency, to disregard them. Subtracting 347—the number of abortions and premature cases—from the total, the percentage of contractions would be raised to 11.56, which is nearer the conservative estimate of Litzmann and Schroeder. In 563 of these 654 cases of contraction, or in 86.08 per cent., the presentation was a vertex, and the delivery was without operative interference. A study of these spontaneous deliveries shows that in all cases the contraction was slight, a true conjugate of  $3\frac{1}{2}$  inches or more, but 3 cases of  $3\frac{1}{4}$  and 1 of  $3\frac{3}{8}$  being noted. A certain proportion had a protracted first stage, in some cases as long as twenty-four hours. Frequently



I would find it recorded that the head was delivered in the right occipital position, but in one or two cases only was the occiput posterior. I have not attempted to obtain exact figures on the frequency of right positions, for the reason that I have doubts about the accuracy of diagnosis. Many of these were undoubtedly occipito-posterior positions at the beginning of labour, and rotated anteriorly before delivery. Some of the cases of protracted first stage were undoubtedly due to a slow forward rotation of a posterior occiput. The percentage of spontaneous deliveries reported from Leopold's clinic was 69.5.

It is well known that the size of the pelvis is not the only factor that must be considered, but that the diameters of the child's head are of equal importance. I had hoped to be able to report some definite conclusions in regard to this point also, but regret that, although the measurements of the head are in every case taken, as well as the weight and length of the child, a comparison of the figures gave no definite results. In some instances, when the labour was protracted and difficult, the head measurements were found to be large and the weight of the child above the average; but in other cases the reverse was true.

In the remaining cases in which interference became necessary 101 operations were done as follows: Forceps, 43; version, 29; breech extraction, 18; symphyseotomy, 5; craniotomy, 2; Caesarean section, 1; decapitation, 1; induced labour, 1; conversion of brow to vertex, 1.

In some instances more than one operation was done on a single case, as, for example, symphysiotomy followed by version, so that the number of operations is greater than the number of cases—101 operations on 91 cases. A study of the results of these operations is interesting as regards the effect on the child. In the 43 forceps operations 6 children were stillborn, and of the 37 born alive 1 died in a few hours, 2 on the second day, and 2 on the fourth day. The remaining 32 were alive and apparently healthy when discharged from observation, usually about the tenth day. This is an infant

mortality in forceps cases of  $25\frac{2}{3}$  per cent. It must be remembered, however, that forceps were applied to only the more difficult cases. A patient is reported as not progressing satisfactorily, and a call for assistance is sent back to the hospital. The case is then visited by one of the staff, and finally the attending physician is summoned. The result of this routine is that practically only those cases were delivered by forceps which could not have been delivered without aid, and some of them were exceedingly difficult.

Of the 29 versions which were done, the operation was undertaken in only 9 cases by reason of the pelvic deformity alone. The remaining 20 cases were complicated: 7 times by a prolapse of the cord, 5 times by a previous symphyseotomy, 4 times by a placenta praevia or "haemorrhage," twice by traverse presentations, and once each by a prolapsed arm and a face presentation. Of the entire 29 cases only 3 children were stillborn. One child died on the second day. What is remarkable, none of the stillbirths occurred in complicated cases. In the version cases the total infant mortality was  $13\frac{2}{3}$  per cent. As regards the other operations mentioned, all were done in strongly contracted pelves, with the exception of the 18 cases of breech extraction. An analysis of these operations would necessitate a detailed history of each case, which would be beyond the scope of this paper.

The general results in the 654 cases of contraction observed, are as follows: One maternal death; a case of placenta praevia, almost exsanguinated when seen, dying from shock four hours after delivery. Twins occurred nine times, making a total of 663 children. Of these, 31 were stillborn. In only 4 cases was I unable to find a cause for death: 4 were premature; 4 macerated; 2 craniotomy cases, and of course dead before operating; 3 died from haemorrhage from a placenta praevia; 2 deaths were due to a prolapse of the cord; 1 child was hydrocephalic; 1 was decapitated; 1 during a breech extraction; and finally, the 6 forceps and 3 version cases mentioned before, leaving 4 deaths

unexplained. Including the 5 deaths subsequent to a forceps delivery and the one following a version, the total infant mortality is 37 out of 663, or 5.58 per cent., an exceedingly small proportion when we consider that all were in cases of contracted pelvis, and some of them operative cases, as difficult and under as unfavourable surroundings as could well be imagined.

The most important conclusion that can be drawn from these observations is in regard to the frequency of contraction. Using the standard of measurements adopted in the German hospital reports, contractions occur here with nearly the same frequency,—10 or 11 per cent. here as against 14 per cent. abroad. To determine the average frequency it is necessary to collect a large number of cases. In making up the figures which I have reported the cases were taken in groups of one hundred each. In three different series of a hundred but one case of contraction was noted, while in one series of a hundred twenty cases were noted. Observations on only 100 cases, therefore, might in one instance show a frequency of 1 per cent., and in another 100 a frequency of 20 per cent. Grouping the cases in series of 500, the smallest number in a series was 9, and the largest number 83, a very wide variation. In groups of 1,000 cases the variation was from 53 to 137. In three groups of 2,000 cases each the frequency was respectively 154, 249, and 251.

Diagnosis of contraction is possible only by careful actual measurements. A pelvimeter should form part of the obstetrical outfit of every practitioner. Pelvic mensuration should be employed as a routine practise in every case of confinement. Referring once more to the frequency, it will be observed that the number of cases progressively increases, showing that with practise and increased skill slight degrees of contraction may be recognised which are ordinarily overlooked. In the last two groups of 2,000 cases each the variation is only two, viz.: 249 for the first group and 251 for the second. The diagnostic value of a shortened external conjugate is questionable. I have included such cases

in my statistics for the reason that they are included in other statistics with which I desired to make comparisons. An external conjugate of seven inches or less may be said to render the existence of a true contraction extremely probable. If the pelvic bones are slight the external conjugate may be seven inches, or even slightly less, and still there be no actual flattening.

It has been shown that the majority of cases of contraction are spontaneously delivered, and the results are good for both mother and child. When there is only a slight degree, a true conjugate of three and a half inches or more, the treatment which gives the best results is expectant and non-operative; aid the natural forces; keep the bladder and rectum empty; stimulate pains; support the strength of the patient; and, when considering operative interference, be guided by other conditions. The obstetrician, knowing the pelvic diameters, the presentation and position being normal and the pains good, who treats his patient expectantly, will have better results than one who operates simply because labour is delayed.

In pelves with a true conjugate of less than three and a half inches, operative interference usually is imperative. Only four such cases were spontaneously delivered. The nature of the operation depends both on the degree of contraction and the size of the child's head. Just under three and a half inches either forceps or version may be done. The infant mortality in forceps was a little more than twenty-five per cent., and in version a little more than thirteen per cent. This seems to show that version is the better operation, but a larger number of observations may demonstrate the reverse. Pelves in which the true conjugate is much less than three and a half inches call for more severe operations, and each case must be treated according to its individual requirements. At present the indeterminate factor is the size of the child's head. It is to be hoped that the instrument recently invented by Farabeuf for measuring the size of the head will prove of value. Should this be so, one

of the main difficulties in treatment, namely, the necessity and choice of operations, will be at least partially removed, and a plan of procedure based on ascertained mechanical conditions alone will become practicable.

#### DISCUSSION.

Dr. GEORGE T. HARRISON, of New York county, said he thought the Association should be thankful to the author for having shown in this paper the exact frequency of the minor degrees of pelvic contraction. Heretofore, the impression in the profession had seemed to be that while pelvic contraction might be frequent abroad, it was quite rare in this country. Personally, he had found that pelvic contraction was very often met with in this locality. It was extremely important in this connection to determine the size of the child's head, and he hoped the instruments just exhibited would be found useful for this purpose. The statistics presented were interesting also as showing the superiority of version over forceps. He had never been able to understand why an obstetrician should desire to use high forceps in a contracted pelvis. As Olshausen had said, the forceps was as well fitted for contracted pelvis as the fist was for a sore eye. In his own opinion, the forceps were absolutely contra-indicated under these circumstances. He was reminded of a case of contracted pelvis in which one of the physicians, who insisted upon doing a high forceps operation, finally gave up after working all night. Dr. Harrison had then effected delivery in ten minutes by version. The forceps had not only killed the child, but had pulled off a large piece of the scalp. Sir James Y. Simpson, he thought, had conclusively demonstrated the superiority of version in this class of cases. The trouble was that the younger members of the profession rarely, if ever, read any of the writings of the great men of the past. He could hardly agree with the reader of the paper as to the adoption of the expectant plan of treatment. Where the previous history showed that there had been some difficulty in labour, he thought it much better to employ version as soon as the os was sufficiently dilated.

Dr. Q. T. LUSK, of New York county, said it was a little curious that in considering the various subjects for discussion at the gynaecological congress to be held at Geneva next September, one of



the six subjects selected was the one just presented to us. It was considered of the utmost importance to determine the frequency of contracted pelvis, the methods employed in its management, and the results, as collected in all parts of the world. The speaker said that he had been asked to present the necessary facts and statistics for this country. Pelvic contraction in this country differed from that abroad chiefly in presenting the minor degrees of deformity. There could be no general rule regarding general methods of treatment. Between three and three and a half inches, the mechanism of labour was usually only somewhat disturbed, and as a rule labour terminated spontaneously. Below that point everything depended upon the character of the pelvic deformity. If between three and three and a half inches, we should wait until the head was fixed at the brim, and if this occurred, the high forceps operation was justifiable. If skilfully performed, the child would be delivered alive. If, however, the head were not fixed, then version, symphyseotomy or Caesarean section, should be selected. By version we probably deliver more living children than by forceps, but the infant mortality of children delivered by version is always very heavy. If the pelvis were generally contracted of course neither version nor forceps would be apt to succeed. If, however, the disproportion between the head and the pelvis were not considerable, and it was remembered that usually the sagittal suture was directed to the front at the brim, that the posterior parietal bone must find a pivot at the promontory, and that the head rotate backward in order to pass below the pelvic brim, it would be found that the instrument just presented would not only measure the child's head, but would facilitate just this part of the mechanism of labour. When the head had once entered the pelvis, the instrument was to be taken off. There was no force exerted with this instrument, and with these precautions the danger from its use must be very slight. He hoped the time was rapidly coming when craniotomy on living children would be banished from our records. Of course if the children were dead, or dying, there was no use in applying forceps: it was better to perform craniotomy. It was to be hoped that with the improved methods—symphyseotomy and perhaps Caesarean section—that craniotomy on the living child would soon be a thing of the past. Symphyseotomy was supposed to be a very simple operation, but a knowledge of many little details was necessary to its successful performance. Only about four operators in the whole world had had especially excellent results.

Dr. FLINT, in closing the discussion, said that in this paper he had been compelled to limit the subject to a consideration of only the minor degrees of deformity. Of course it was difficult, practically, to limit the degree. The statistics presented were collected only from New York city where there was a large foreign population. The major contractions of the pelvis were quite infrequent here, especially as compared with the statistics from abroad. The relative advantages of forceps and version were very variously stated by different obstetricians, and the personal equation was an important factor. The art of version could be more easily acquired than a knowledge of the proper method of employing the forceps.

## SUPPURATIVE PANCREATITIS.

By JAMES K. KING, M. D., of Schuyler County.

*Read by title, October 17, 1895.*

All diseases of the pancreas are of special interest to the physician: (1) on account of their rarity; (2) on account of the difficulties in the way of making a definite diagnosis; (3) on account of incomplete and unsatisfactory method of treatment.

Any points that will aid in either the diagnosis or treatment of the comparatively rare and obscure pathological conditions of this important organ, cannot fail to be of practical value.

There is much interest manifested, at present, in the study of diseases of the pancreas and their effect on the digestion of albuminoids, starches, and fats. Muller, Mering, Minkowski, Zenker, Friedreich, Draper, and many others, have added much to our knowledge of this subject. At the forty-fourth annual meeting of the American Medical Association, held at Baltimore, May, 1895, Dr. J. E. Atkinson made a valuable contribution to our literature, on the symptoms of the diseases of the pancreas.

In all morbid conditions of the pancreas, whether acute or chronic, haemorrhagic, suppurative, or gangrenous pancreatitis, whether cysts, calculi, or even cancer in the pancreas, we are, to a great extent, dependent on the same line of symptoms in making our diagnosis. Pain, swelling, and tenderness in the region of the pancreas, are always suspicious symptoms. If, in association with these indications, we find a recently developed glycosuria, or fatty matter present in the stools, or in the urine, when there has not been an excess of fat or sugar, or starchy food, allowed in the diet, we should suspect at once some trouble with the pancreas.

The most careful attention to diet, remedies, and examinations is necessary to differentiate morbid conditions of the pancreas from each other, and from diseases affecting other digestive organs. In haemorrhage, or cysts, or suppuration, we have a small portion of the pancreas, either its secreting cells or ducts, affected, or we may have a large portion of the tissue involved. It is obvious that, in these different conditions, great care must be exercised in following out the lines of investigation, and close attention given to the difference in the symptoms obtained, and a careful estimation must be made of the character of the excretions.

The weight of evidence by investigations and experiments would tend to prove that haemorrhagic pancreatitis is due largely to traumatism, and, on the other hand, suppurative pancreatitis is not likely to be caused by external or traumatic influences.

I will give quite fully the history of a case of chronic suppurative pancreatitis, because of its rarity and the difficulties in making a definite diagnosis, unless aided by exploratory incision. There are many points in this case that will aid in diagnosing others correctly.

Mrs. L. C., forty-one years of age. Has always been rather delicate. In March, 1894, while out walking, she met with a serious accident by falling on the icy pavement, and felt sure that she had "strained" the abdomen. She thought she felt something give way. Soon afterward she had a great deal of pain, but could not give much attention to herself, nor take any rest, for her husband was very ill at the time. He died about a week after the accident. The pain continued, and about three weeks after his death, when she had partially recovered from the shock incident to the injury and her trouble, she was taken to a hospital. She was very nervous, slept very little, and complained frequently of pain in the abdomen. The bowels were constipated, and she was troubled much with cystitis. After she had been in the hospital some weeks, the diagnosis made was "nervousness." Creosote was administered for the dyspeptic symptoms. The effect was not favourable, for it produced a great deal of irritation of the stomach and bowels. The urine for some days was dark and murky in appearance. Later, cascara was given, and followed by a soap and

water aenema. Following the use of these remedies the bowels became relaxed, and this condition merged into a chronic diarrhoea which lasted for months.

She came under my care the later part of August, 1894. She was then much emaciated, and was able to take, retain, and digest but little food. The bowels were loose, and the movements were accompanied by much pain. The mouth and tongue were very red and sore. She had cystitis accompanied by much frequency and considerable pain. The urine contained a large quantity of mucus and blood corpuscles. The heart action was very weak, and the pulse rate 120. There was no organic heart disease. The temperature ranged from 99.8-10 to 101. The stools were very offensive, and contained pus, blood, and fat globules. A careful physical examination revealed much tenderness over the abdomen, and a tumor about the size of a goose egg, situated in the region of the pancreas. She was so tender on pressure over this region, and it gave her so much distress, that it was impossible to make a thorough examination.

I found several very painful fissures and ulcers in the rectum, and as she had so much trouble with the bowels, and anodynes gave her only temporary relief, it was decided best to administer an anaesthetic, and dilate the sphincters, and at the same time make a thorough examination of the tumor. As a result, the rectal trouble was entirely relieved, and the tumor was located with much certainty, as attached to, or a part of, the pancreas.

By the use of food stimulants, tonics, and hygienic treatment, her strength was improved as much as possible, but the actual symptoms were not greatly benefited, with the exception of strengthening the heart action and correcting the diarrhoea.

November 1 the tumor was still the same size. Explorative incision was proposed, but was refused. Early in November a general anasarca began to develop, and gradually increased until November 28, at which time the whole body had enlarged to at least twice its former size and weight. There were no indications of any disease of the heart or kidneys. The most careful examination revealed nothing abnormal.

The anasarca must have been due to pressure on the larger veins. All the approved diuretics were tried in succession, and gradually the anasarca disappeared, and at the same time the tumor gradually disappeared also.

The character of the dejecta seemed to indicate clearly that the tumor had become attached to the bowels by adhesive inflamma-



tion, and had ulcerated into the duodenum, and that the contents were discharged by this channel.

The dejecta contained much pus, blood corpuscles, and fatty globules. The character of the stools gradually improved, and the fat globules disappeared from their discharges, as the functions of the pancreas were restored. The effusion was all removed. The heart action gradually became slower and stronger. The temperature decreased to normal. The appetite improved slowly, and by carefully regulating the diet she has gained in flesh and strength, and there is every indication that the patient will ultimately be restored to health again.

## A STUDY OF HYSTERIA AND HYPOCHONDRIASIS.

By CHARLES E. LOCKWOOD, M. D., of New York County.

*October 17, 1895.*

The period in which we live seems to be peculiarly fruitful in the production of mal-nutrition, degeneration, and diseases of the great nerve centres, which has been variously ascribed to different factors. The fact that the census of 1890 showed that eighty-seven per cent. of the total population, over ten years of age, could read and write, would seem to be of interest in this connection, as one writer remarks: "It may be fearlessly asserted, that, in the history of the human race, no nation ever before possessed forty-one million instructed citizens." Then, in this age and in this country, the problems of human existence have been rapidly growing more vast and complicated, and the rapid succession of events, which are now daily reported to us from all quarters of the globe, together with the great strain on the higher cerebral centres, incidental to the great struggle for wealth and existence, combined with the absence of proper periods of rest, and the lack of general systematic cultivation of out-door games and sports, and means of mental diversion, are hardly calculated to favour healthy cerebral nutrition.

It may also be reasonably asked whether the human brain is not passing through a period of great strain and re-adjustment to a new environment, and is suffering as a consequence until such time as advanced ideas shall indicate the proper methods of meeting the new conditions, and here it seems proper to call attention to the tendency to centralisation, specialism, and the increased interest in athletics as a step in the right direction. However this may be, rich and poor

seem to be equally affected, and in the field of my observation, the out-door department of Bellevue Hospital, New York, I have been surprised to observe the great prevalence of such conditions of the higher nerve centres among the poorer labouring classes, embracing such occupations as are not usually thought to be attended with excessive mental strain, and, on investigation, one finds that they are all men and women of like passions with us, and that the unsettled intellectual convictions of the present century, ancestral tendencies, individual environment, all the various causes which tend to excite or depress the emotional nature, alcoholic excesses, absorption of nicotine and lead among workers in tobacco and lead, self-abuse, sexual excess and syphilis, all play their rôle here, as well as elsewhere, in producing vital depression and favouring malnutrition and degeneration and abnormal mental states. In the study of the causes of hysteria and hypochondriasis, we have to do with mental and physical factors, and largely with mental disturbance; it seems, therefore, fit to inquire carefully as to what favours healthy brain action and its opposite.

The human body may be compared to a kingdom inhabited by a large number of different denizens, and visited by many intruders, who, having effected an entrance, gain control and work mischief. The thinking brain is the ruling monarch, and should be most carefully guarded, and kept in the most perfectly healthy condition, and should reign supreme, choosing its code of principles, and carrying them out inflexibly through its prime minister, the will. Anything which interferes with the healthy tone or working of the brain, or its powerful agent, the will, affects the whole body unfavourably, and each re-acts on the other, hence the maxim: "*Mens sana in corpore sano.*" Now, what are some of the mental and physical conditions which are needed to secure healthy tone and action for the thinking portion of the human brain?

1. Hereditary transmission.

2. Proper mental and physical training, combined with a

suitable environment, based on a careful study of the mental and physical conditions of the ancestry and the individual.

3. The correction of all physical defects calculated to interfere with the general nutrition. "If the brain is not well supplied with an abundance of nourishing and pure blood, its functions cannot be well performed."

4. The adoption of the most reasonable, convincing, and soul-satisfying theory of man's place in nature, his origin, mission, and destination.

5. The recognition of the animal propensities in man, and the importance of their control by educated higher centres.

6. The adoption of a code of principles best adapted to promote the securing of the highest development, mental and physical.

7. The selection of some line of mental or physical work based on a careful study of mental and physical peculiarities of the individual and ancestry, which shall give a definite and useful aim to life.

8. The keeping out of the mind all influences, ideas, and habits calculated to defeat the end in view, or cause mental or physical deterioration.

9. The keeping out of the mind all superstitions, imaginations, and unrealities which are calculated to weaken reason and self-control.

This is an age of materialism run riot. Every one seems to be looking for some cause which can be appreciated by the five senses, not laying enough emphasis upon the thoughts which are allowed to enter the human brain, and which are just as powerful to produce disease as germs. We come into the world with powerful appetites and special centres for their functional exercise, and above them a higher centre, the seat of the reason and will, weak in many cases and not fit to rule, through inexperience, without the help of the most able and far-sighted advisers: Is it any wonder, that, with a certain hereditary pre-disposition and environment, the lower centres, in many cases, gain control, while the higher centre sleeps, and mind and body are deteriorated by

force of evil habit and mal-nutrition until there seems to be no hope of healthy mental action, and every variety of morbid thought and morbid impulse runs through the poor, weak, unresisting brain, until all mental control is lost, and the poor sufferer is, like a ship which has lost its rudder, at the mercy of the winds, storms, and waves of evil and unrestrained passions, appetites, and morbid thoughts and impulses?

10. The early training of the young in the habit of self-control, as here parents most frequently lay the foundation for future hysteria and hypochondriasis.

11. The careful avoidance of alcoholic excess (especially in hereditarily pre-disposed individuals), and drug habits.

12. The selection of proper forms of mental diversion and recreative physical exercise, and the cultivation of such social relations as will stimulate the higher faculties and emotions.

13. The forming of habits of self-reliance and individual thought and action, regardless of external influences, so as to increase the power of each individual factor.

14. Submission to destiny.

Having enumerated some of the conditions necessary to promote healthy brain action, without claiming to have exhausted the subject, let us look for a moment at some of the causes which are productive of unhealthy brain action, and again we must mention,—

1. Hereditary transmission.

2. Improper mental and physical training, combined with unsuitable environment.

3. Physical defects which interfere with general healthy nutrition.

4. The lack of adoption of definite principles, looking toward uniformity of thought and action and formation of fixed habits, which tend to the making of a well-balanced mind.

5. The constant indulgence of the animal appetites against the voice of conviction, involving the weakening of self-control.



6. The lack of occupation and motive in life, allowing of too much introspection.

7. The harbouring of beliefs based on superstitions and imaginations, involving the stifling of reason.

8. The excessive use of alcoholic stimulants, opium, or tobacco.

9. The lack of proper mental diversion and physical exercise.

10. The effect of low states of health, due to some poison in the system, involving continuous watching for outbreaks, or of chronic diseases, especially of the sexual organs, so that the mind is almost constantly pervaded by the same train of thought.

11. Climatic changes, especially when sudden and of extensive range, involving a frequent re-adjustment of the system with consequent vital depression.

12. The circulation in the blood of poisonous germs, metals, or toxic matters, the result of mal-assimilation or indigestion, as happens in malarial poisoning, syphilis, lead and mercurial poisoning, alcoholic excess, uraemia, or uric-acidaemia, rendering the circulating fluid unfit for healthy nutrition and predisposing to degeneration.

13. The tendency of the thought and practise of the present age, among young men and women, seems to be antagonistic to the consummation of marriage and the assumption of the duties of motherhood and fatherhood. Young men, discouraged by the extravagant demands of the other sex and their longing for luxury, idleness, and excitement, are led to lead isolated lives, finding their social pleasures in various ways, which lead, in any case, to unsettled convictions, a lack of definite aim, selfishness, and introspection, and many deserving young women are driven to seek employment in various occupations, or lead lives devoid of the incentives which tend to the highest development of the female nature.

14. The influence of a degenerate literature and art inculcating the following of the lead of the emotions, and the

consequent stimulation of the lower centres and lowering of the influence of reason and self-control.

To sum up, anything which favours healthy ratiocination and increases the habit of self-control, or favours the conservation of that mysterious something which we call vital force, together with favourable hereditary transmission, or the use of proper measures looking toward the correction of hereditary defects or unhealthy conditions peculiar to the individual, these tend to favour healthy brain action, and the opposite conditions, unhealthy brain action.

There are two affections to which humanity is liable—hysteria and hypochondriasis—which, in my opinion, are peculiarly the result in great measure of defective action of the higher centres, the *reason and will*, in their inhibitory action on the lower centres; in other words, long weakening of reason and will, and defective training of the higher centres, the seat of these faculties, is followed by undue and unrestrained action of the lower centres, producing diseased conditions, mental and physical, and this result is naturally favoured by any cause which interferes with healthy nutrition.

Hysteria is a yielding of the mind to any morbid impulse that enters it.

Hypochondriasis is a mind habit of dwelling on bodily functions until it becomes second nature, and the mind becomes in this way sensible to impressions which, in health, are unperceived and are now misinterpreted; or, in other words, it is a morbid concentration of the mind on the various bodily organs, functions, and sensations, to which the subject attributes false pathological significance.

The causes of the two conditions are partly physical, but largely mental; any physical condition which interferes with healthy nutrition, such as indigestion, mal-assimilation, reflex irritation, the circulation of toxic matters in the blood, may be a potent initial factor, but the habit of mental non-resistance, self-concentration, the paralysis of will, and the neglect to use the reasoning faculties in the interpretation

of symptoms presented, are largely responsible for the phenomena presented by these two affections. The class of persons most liable to these affections are those of neurotic ancestry and possessing a neurotic or mercurial temperament, with strong imagination and emotions, easily elated or depressed, and rather moved by impulse than reason, deficient in self-control, and without definite aim in life and mental occupation.

Following Dr. G. L. Walton's classification in "Wood's Reference Handbook of Medicine," the symptoms may be briefly classified under disturbances of sensation, disturbances of motion, circulatory, secretory, and excretory disorders, and disturbed mental conditions.

As illustrative of disturbances of sensation, I refer briefly to the following cases, which have come under my observation:

Mrs. R., a widow, had a sensation as though all the blood in the body was flowing into a space about the size of the hand, on the right side, accompanied with pain, a sense of tightness and suffocation. She was suffering from fatigue at the time I saw her, and had been told that one lung was diseased. She also had a sensation as though the house was moving. She was completely relieved by teaspoonful doses of elixir of valerianate of ammonia, given every hour or two during the entire night.

Mrs. H., while taking lunch with some friends, had a sensation as though a corkscrew was being bored up through her brain, and was told by her friends that her face was turning purple. I was asked by her husband to see her, as he feared apoplexy. Under the elixir of valerianate of ammonia, in drachm doses, when needed to combat symptoms of nervousness, and a course of Fellow's hypophosphites, there were no further attacks.

Mr. S. S., never ill, except had the grippe two years ago, followed by neuralgia, which was cured by galvanism and tonic treatment. He complains of a peculiar sensation when he gets run down and tired, as of something rushing from below the right clavicle and spreading over him; can bring on these attacks by thinking of them.

The following case illustrates well disorders of motion and circulation:

Dr. T., aged forty-three years, unmarried, practised self-abuse excessively when young, having gotten into the habit while climbing a tree. Six months ago, while studying assiduously, had nervous tremor or excitement, and discovered, on left side of the face over the malar bone, a decided flushing, extending to the median line in front, and the face was hot and red on that side; a hissing or buzzing was noticed in the ears, and subsultus tendinum in different parts of the body was discovered, legs jerked and hands jumped in bed, and there was sighing respiration.

As illustrating disorders of secretion and excretion :

Mr. T. D., aged thirty-one years, in November, 1891, had slight attacks characterised by feeling of apprehension and as though the heart was quivering from side to side like jelly. After these attacks, the stomach was distended with wind, and he passed about two quarts of straw-coloured urine. In this case there was also a disturbed mental condition. In April, 1892, he complained that his brain felt like a ball surrounded by a rind, and the brain wanted to work, but the rind remained passive.

A diagnosis of hypochondriasis or hysteria should be made only after most careful examination and interrogation of the different organs of the body, as organic disease is often marked by these two affections. The following history of a case which came under my care will illustrate this point :

Mrs. M. W., aged fifty-three years, consulted me in 1894, complaining of intermittent action of the heart, burning sensation in the region of the left ovary, tender spot over the seventh cervical vertebra, which aches and burns when she is tired, and great exhaustion after exertion, with mental depression and crying spells. She had undergone considerable treatment, for two years, at the hands of different physicians with indifferent results. A careful examination of the urine showed a slight trace of albumen, specific gravity 1024, and mucus and hyaline casts, one with a renal epithelial cell attached. Treatment was conducted on the lines of a diet to restrict the intaking of nitrogenous matters, elimination and dilution of the urine, keeping the skin and bowels open to promote the elimination of waste and relieve the kidneys, but, two months after I first saw her, nausea and vomiting set in with symptoms of uraemic poisoning, and, in spite of careful treatment, the patient died.

As regards the prognosis of these cases, all depends, it seems to me, as to whether we can so change the mental condition as to reinstate reason and self-control, and divert the mind from self and introspection to outside subjects and objects, and this can only be accomplished by supreme confidence of the patient in the correct interpretation of his condition and the methods employed, and unwavering perseverance until the mind regains a healthy equilibrium.

The pathology of these cases is obscure, but probably consists in a disturbance of the balance of nutrition either through mental influence or otherwise.

*Treatment.*—Treatment may be considered under the heads Preventive and Curative. Prevention of the conditions under consideration, may not always be possible owing to inherited pre-disposition, individual environment, and physical states; but in the line of preventive or modifying measures we may mention the cultivation of reason and self-control, the maintenance of healthy nutrition, the adoption of definite principles of living, based on the ambition to reach the highest mental and physical development, and the giving to life a definite aim and purpose by pursuing some line of work beneficent to others and self, the avoidance of all unnatural methods of stimulation of the animal appetites, a careful study of the individual and his ancestry, and so ordering his life as not to bring excessive strain on the great nerve centres, but by careful cultivation of the higher centres to bring about that mental equilibrium characteristic of a well-balanced mind, in which the emotions are held in check by reason and will. A doctor must be, in the interests of health, a moralist, a close student of human nature and life in general, and not a mere giver of drugs.

In the way of curative treatment, it must first be well established that there is no underlying organic disease, and all physical disorders, such as are due to functional derangement of different organs or the circulation of toxic matters in the blood, must be attended to, together with proper directions as to diet, *mental diversion*, physical exercise, and



the cultivation of cheerful social surroundings; which having been accomplished, the mental condition most urgently claims our attention.

And here the words of M. Paul Bourget, in his masterly address before the French Academy, on June 13, 1895, seem most pertinent. In speaking of the life of his eminent predecessor, M. Du Camp, he points to his youth as a time of emotional and intellectual confusion and revolt, when he wrote what he called "sad books," and he goes on to say,—  
"To me the most singular and least agreeable fact is that I have suffered horribly from this condition of mind. Indeed, when I turn back to judge myself impartially, I perceive that I found my equilibrium only when near my fortieth year. Vague aspirations, hours of gloominess without a cause, motions without object, all these bordered close on hypochondria, and if anyone should show me to-day that I have been somewhat insane, I should be neither indignant nor astonished." M. Bourget then says,—  
"You recognise the very definition of that which was long called 'the disease of the century.' Call it by whatever name you please, it is an incapacity for accepting life and the advice given by the English essayist that 'man's great work is to carve for himself in the hard marble of life the white statue of serenity.' "

Finally, M. Bourget sums up as follows: "Having commenced by considering life like a true child of the century, as a matter of emotions to be hated when it was not conformed to our desires, he arrived at a recognition of the fact that the whole worth in this life is in work, in submission to destiny, in the accomplishment of a beneficent task." And here, it seems to me, we find the prevention and the remedy for all hypochondriacal states,—the occupation of the mind by employment useful to others and ourselves, and serene submission to destiny. Such a plan will, I believe, bring about a larger percentage of good results, in the way of prevention and cure, than Christian Science, treatment by suggestion, faith cure, etc., without the damaging effects

produced in the minds of subjects by those unscientific theories.

As regards drug medication, it is a good rule not to use them unless the indications are very well marked, as they serve more or less to fix the patient's attention on self. The drugs useful in these conditions and accompanying functional derangements of different organs, which, when they include those of digestion and circulation, interfere seriously with the general nutrition, may be classed under the heads of sedatives, anti-spasmodics, excito-motors, anti-ferments, artificial digesters, and tonics. The sedative that I have found most generally useful is a combination of bromide of ammonium and tincture of cannabis indica in the proportion of fifteen grains of bromide ammonium and ten minims of tincture of cannabis indica to one teaspoonful of mucilage of acacia, flavoured with essence of peppermint, this being given in teaspoonful doses every four hours for ten days. In cases where it seems advisable to administer the sedative in pill form, I have used a tablet made by the Fraser Manufacturing Company, which contains two and a half grains each of bromide of soda, bromide of potash, and bromide of ammonium, with five drops each of tincture of hyoscyamus and tincture of cannabis indica, giving one tablet three or four times a day. The elixir of the valerianate of ammonia, containing about one to two grains of the salt to the teaspoonful, has given me much satisfaction as an anti-spasmodic. As an excito-motor in cases of sluggish action of the nerve centres, attended with symptoms of slow digestion and general atony, I have found strychnia, in doses of 1-40 to 1-10 of a grain, most efficient. As an anti-ferment in cases of nervous dyspepsia (so-called), subgallate of bismuth, in doses of five to ten grains after meals, has given me most excellent results. The artificial digesters, which I have found most helpful, have been preparations representing the different digestive ferments and an extract of malt rich in diastase. In the line of tonics, I may mention syrup of hypophosphites, with

small doses of strychnia, combinations of strychnine, quinine, pyro-phosphate of iron, and dilute phosphoric acid, as in the Hammond mixture in use at the out-door department, Bellevue Hospital, and another of the tincture of the citro-chloride of iron, quinine, strychnine, and arsenite of soda, the formula of which is as follows :

R	Tr, ferri citro-chlor.....	3 j
	Quinine sulphat.....	gr. lxiv
	Strychnine.....	gr. ss.
	Sodi arsenite.....	gr. 1½
	Alcohol....	3 ij
	Elix. aurant, N. F.....	3 viij

Sig.—One teaspoonful after meals.

Pure cod liver oil.

As to exercise in these cases, I have found walking in the open air the most useful form when taken in moderation, short of fatigue. Exercise on the bicycle may be of service, if carried on with great care, but in many cases the nerve strain incidental to this form of exercise has seemed to be great and attended with unpleasant after-effects. Frequent change of air and scene, and mental diversion, so as to fill the mind with new ideas, is most helpful.

In giving directions as to diet, our aim should be to secure the taking of as much digestible and nourishing food as possible, and aid its digestion and assimilation by such artificial digesters as are at our command ; to avoid taking food when fatigued, and take the heartiest meal in the middle of the day.

In the line of hydropathic treatment, the nutrition of the central nervous system may be improved by the proper use of the hot and cold douche.

## A NEW AND ORIGINAL METHOD OF OBTAINING MATERIAL FOR SKIN GRAFTING.

BY Z. J. LUSK, M. D., of Wyoming County.

*October 17, 1895.*

Among the various methods of obtaining material for skin grafting, none are so universally employed at the present time as those of Reverdin and Theirsch. The credit of healing raw granulating surfaces by the application of minute pieces of cutaneous epithelium is generally conceded to Reverdin,<sup>1</sup> who published his discovery and experience about twenty-six years ago. The subsequent methods reported, differ only in the manner and source of procuring epithelial tissue. Dr. C. B. Kibbler<sup>2</sup> of Corry, Pa., reports having had excellent results with thin slices of calloused or indurated epithelial tissue taken from the palmar surface of the hands or plantar surface of feet, recording several cases successfully treated after this method. Especial emphasis was placed on its being easily obtained, causing no pain or discomfort to the donor.

Dr. John T. Hogden<sup>3</sup> claims to have successfully used "scrapings of epithelium and shavings of corns." The success of these methods has been frequently verified by published reports, all of which indicate that healthy granulating tissue, by some inherent power, imparts life to cuticular epithelium. The contemplation of this fact under circumstances which I will hereafter describe, suggested an experiment which proved eminently successful in a recent case of mine, where nearly six hundred square inches of raw granulating surface was healed in less than six weeks by grafts furnished by patient.

On January 14, Emile Silskey, native of Russia, twenty-three years of age, robust constitution, labourer at Hawley Salt Works,

was trying to separate a salt crust adhering to bottom of pan, when the heavy iron bar which they use, slid without the expected resistance under the crust, and he lost his balance, falling head foremost into pan of boiling brine. Those working near hurried to his assistance and had nearly succeeded in getting him out, when they lost their grip and he fell backward again into the boiling brine. By another effort they succeeded in getting him out.

I saw him very soon after the accident. He was lying on his back with no covering except a sheet loosely thrown over lower part of body. Great bags filled with serum hung from his sides and other parts of the body. Both arms were completely stripped of epithelium, which hung in shreds about the wrists, having been scraped down in his efforts to get out of the pan. The thick calloused skin of the palmar surface of both hands was torn and in shreds. The dorsal surfaces were covered with sacks full of serum. There was a raw bleeding surface six inches wide extending from left arm to middle of right scapula; one of the same character and size covered the lumbar regions. The buttocks were covered with large blisters, but more superficially. The skin on lower extremities hung in shreds, bleeding in many places, especially about knee and ankle joints. The genitals were very oedematous and covered with bullae. There were numerous small vesicles on face and neck and large erythematous patches over chest and abdomen, but no vesication except in right infra-clavicular region, where there was a blister four inches in diameter. It is unnecessary to state that there was profound constitutional disturbance and that no hopes of his recovery were entertained.

However, after a liberal use of strychnia subdermically, together with the application of artificial heat, his pulse became stronger, when dressings were hurriedly applied and he was left in the care of competent nurses. The gravity of this case may be understood when we consider that the area of burned surface covered more than two thirds of the body—indeed there was no part where the blush of super-heat was absent; yet contrary to expectation and precedent, recovery has taken place. His condition seemed hopeless until February 11, when favourable symptoms appeared, and for the first time I thought the fellow might possibly get well. He was extremely emaciated with nearly one fourth of his body a raw granulating surface. The only cutaneous covering on left leg was seven inches wide at trochanter major, narrowing to two inches at knee, covering one third of leg to two inches above ankle. The right, eleven inches wide below trochanter, narrowing to a point



two inches above right knee, commencing two and a half inches below, covered one third of leg, narrowing to one inch over ankle.



Figure 1.

The right knee from two and one half inches below to two inches above, had no dermal covering; left the same, except two inches on outer surface. Upper extremities were covered only by narrow

strips on outer aspect, except at elbows, both of which were denuded of skin. An elliptical space over lumbar region, five by nine inches, and one about the same diameter over left shoulder, were without dermal protection. There were in many places deep gangrenous sloughs, the underlying tissues resuming a more healthy appear-



Figure 2.

ance. The question now was where could material be obtained sufficient to heal these large ulcerating surfaces. None could be provided by patient. I could not utilise the Theirsch method as no one could be found who would consent to giving strips of skin.

I made a beginning on February 13, by applying eight grafts,

taken from indurated tissue on palmar surface of hand of attendant. The next day when I wanted to repeat the operation he declined ; said his hand was tender, that I had cut too close, and



Figure 3.

though it did not bleed, was sore. As nothing more could be done, I concluded to await the results of grafts made the day before.

In the meantime, while reviewing the various methods employed, an idea occurred to me, suggested by the following condition : There were numerous patches of exfoliated epithelium, the remains

of vesication. They were hard, dry, and crispy, having for nearly five weeks been separated from the cutis. Why could not this material be utilised for skin grafting? I had faith to believe that it could and on February 16, in the presence of attendants and others, I made grafts, using the following material: Attached to the dorsum of right foot by one edge, the other being free and raised one fourth inch, was a patch of dry exfoliated epithelium, extending nearly across over surface, near distal end of metatarsal bones; the floating part was from one to one and a half inches wide. From this I clipped off a piece one inch square, softened and sterilised it in warm boric-acid water, and divided it into twelve grafts, which were applied to the anterior granulating surface of left thigh. The result was eminently satisfactory. Seven out of the twelve grafts took and rapidly developed into vigorous islands of skin. The subsequent treatment consisted in using this dried epithelial tissue, with which these large raw surfaces were covered, with substantial skin, by April 1.

He began sitting up a few days prior to this date and with attendant's aid could walk about the room. He improved rapidly during the month of April, and on May 1 began doing light work at the salt works.

The following experiment was made in the presence of my assistant and others: A little to the right and two inches below trochanter major of left leg there was a raw surface three and one half inches in diameter. At proximal end of great toe there was a dry bleached patch of epithelium which had been thoroughly isolated from the body seven weeks, being held by ends of hair. With this material this raw surface was completely healed in twenty-one days.

At the spring meeting of Wyoming County Medical Association I had the pleasure of exhibiting my case, reporting method of treatment. Dr. Roswell Park of Buffalo, who was present as our guest, complimented me on my discovery, commenting particularly upon the integrity and firmness of skin, the perfect use of joints, and the entire absence of cicatricial contraction.

In reporting my case I mentioned the difficulty experienced in properly shaving the skin in the Theirsch method and how liable we are to snip too deep in that of Reverdin. I also made the following statement, which I have since verified, which was that the epidermis raised by vesication could be

successfully employed in skin grafting. By this method the cuticle is separated from the cutis, giving us the ideal material, indeed the same employed with successful results in the case reported. An opportunity of demonstrating practically this method, occurred on August 3, when I was consulted by Mrs. M., married, age fifty-two, housekeeper, who had a large varicose ulcer, two and a half inches in diameter, three inches above ankle on outer surface of left leg. She had worn elastic hose and tried all kinds of ointments for the last eight years. The granulations were unhealthy and bathed with a foul-smelling discharge. The treatment consisted first of thorough curettement, followed by stimulating applications, so that by August 13, the granulations appeared healthy. A surface on left thigh near ant. sup. spin. proc. was made aseptic, on which was applied a piece of Johnson & Johnson's emplastrum cantharidis, two inches long by one inch wide (it being first moistened with carbolised oil). Vesication was produced in six hours, when the plaster was carefully removed. The epithelium was detached at edges of blister, washed in boric-acid solution, after which all moisture was absorbed with sterilised cotton and it was suspended in a four-ounce, salt mouth bottle, aseptic cotton being used for a stopper and kept at a temperature between 55 and 70 F. It was thoroughly dry in three days, when a piece one inch square was divided, making twelve grafts, which were applied in the usual way. The results were extremely gratifying. Nine of the twelve grafts took nicely, and grew rapidly so that by September 3 this ulcerated surface was healed, having a substantial epithelial covering.

A great many experiments have been made to ascertain the limit of vitality of the skin after its removal. Dr. J. H. Girdner claims to have successfully used grafts, removed six hours after death, from the body of a young man who died from haemorrhage. Dr. E. P. Brewer, of Norwich, Conn., found that thirty-six hours was the limit of vitality, out of eight trials in which he used pieces of skin from amputated limbs. Georges Martin experimented with grafts kept at dif-



ferent temperatures, claiming that grafts retained their vitality ninety-six hours, at a temperature just above 32 F.; that confined air gave better results than free air.

I can see no practical object of the first two experiments, for very soon after death chemical changes occur, by which ptomaines are formed which would destroy the vitality of the skin, even making it dangerous for experimental use. So far as the temperature is concerned in maintaining the vitality of grafts, if they are properly separated, sterilised, and dried, they can be kept almost indefinitely at a temperature between 40 and 90 F., and before using they should be softened and sterilised, preferably in warm boric water, and when applied to a healthy granulating surface they will become revitalised, developing rapidly into substantial tissue coverings.

Just how these small epithelial grafts are revitalised, when applied to granulating surfaces, has never been fully explained. In an article on "Leucocytes and Nuclein," under the head of Nutrition, Dr. T. O. Summers, of St. Louis, writes:

"The conversion into tissue or imparting molecular activity to material, lifeless in itself, is a wonderful phenomenon. We cannot explain the affinities by which certain kinds of pabulum are accepted and rejected by the several tissue cells of the body. We know this, however, that the change that goes on is the elaboration of a vitalised cellulised substance which is capable of entering at once into tissue as soon as it meets the various cells which have this power of elective assimilation."

In briefly reviewing, I desire to report the following observations:

1. The best results were obtained from the thin, transparent epithelial tissue. It made no difference whether one or both edges were attached; just as satisfactory results followed the use of dried patches, with no attachment except at distal ends of hair.

2. The certainty of their attachment and rapid development, when properly applied.

3. The absence of cicatricial contraction, the skin being

loose and in many places, especially on back and thighs, so natural as to require close examination to discover its artificial nature.

#### DISCUSSION.

Dr. FREDERICK HOLME WIGGIN, of New York county, said that Dr. Lusk was certainly to be congratulated on the happy thought embodied in this new treatment, and also on the successful termination of the case.

Dr. DIDAMA asked why the tissue had been kept for two or three days at a certain temperature, instead of being applied at once.

Dr. LUSK said that the results obtained in his case had been secured with dried epithelium, and as this form of tissue was usually recommended in surgical books, he had dried and sterilised the tissue before applying it in the form of grafts.

#### BIBLIOGRAPHY.

1. Bulletin de la Soc. Chirurg. 1869. Gazette des Hospitaux, 1870.
2. Railway Surgeon, vol. 1, page 126, August 14, 1894.
3. Int. Cyclopaedia of Surgery, vol. 2, page 288.
4. Medical Record, vol. 20, page 119.
5. Medical Record, vol. 21, page 483.
6. Encyclopaedia of Surgery, vol. 1, page 543.
7. Journal of American Medical Association, vol. 24, page 963.

# THE TECHNICS OF MAUNSELL'S METHOD OF INTESTINAL ANASTOMOSIS, WITH A SUMMARY OF THE CASES OF OPERATION TO DATE.

By FREDERICK HOLME WIGGIN, M. D., of New York County.

October 17, 1895.

Soon after the publication by the writer, in the *New York Medical Journal* of January 20, 1894, of the report of a successful case of intestinal anastomosis effected by Maunsell's method, a letter of congratulation was received from the late Prof. H. Widenham Maunsell, who had recently removed from New Zealand to London. He stated that he was dissatisfied with the published description<sup>1</sup> of his method of intestinal suture. Last winter, after the publication by the writer in the *New York Medical Journal* of December 1, 1894, of an article entitled "Intestinal Anastomosis," read before this Association on October 11, 1894, in the course of which a comparison was made between Maunsell's method and that of Murphy, of Chicago, so much interest was shown in regard to the former method, and so many inquiries were made for information as to various details of the technics, and as to where a description of the method could be found, that a letter was addressed to Dr. Maunsell, requesting him to revise and republish his article. Unfortunately, before this letter reached its destination, Professor Maunsell had died from an attack of the grippe. A friend, in announcing the unhappy event, said,—“Science has lost a devoted and enthusiastic student.” The same letter conveyed a request from Mrs. Maunsell that the writer should undertake the revision and publication of the article which he had re-

<sup>1</sup> American Journal of the Medical Sciences, March, 1892.

quested Dr. Maunsell to rewrite. The task the writer now undertakes, as a tribute to the genius which conceived and the courage which first executed this admirable surgical procedure, and as an acknowledgment of the debt which he is confident time will prove intestinal surgery owes to this distinguished surgeon.

*Technique of Maunsell's Method of Intestinal Anastomosis.*—

The patient having been prepared in the usual manner for the performance of a laparotomy, and having been anaesthetised, the operation is begun by making a median incision in the abdominal wall below the navel, extending it upward if it prove to be necessary. This opening permits a quick and thorough search to be made for the diseased or

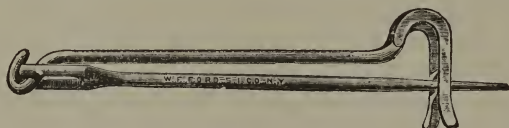


FIG. 1.

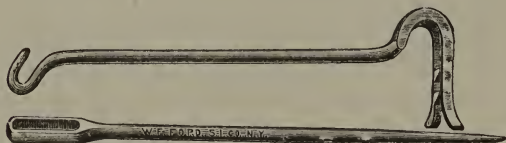


FIG. 2.

McLaren's Clamps.

injured portion of the bowel. For operations on the appendix vermiformis, the caecum, or any part of the ascending or descending colon, the rule is to make an incision over the site of disease or injury, if it can be localised. In all doubtful cases the median incision is to be preferred. The abdomen having been opened, and the portion of the intestine to be excised located, it is brought outside of the cavity, accompanied by about six inches of healthy intestine on either side. It is next emptied of its contents above and below the diseased part by passing it between the finger and thumb and gently compressed. The empty gut should be clamped on either side of the diseased portion of the bowel

at points six inches distant, to prevent the escape of faecal matter at the time of excision, or during the subsequent manipulations, either by the clamps devised by Dr. W. S. McLaren, of Litchfield, Conn., or by those improvised as suggested by Maunsell from a safety pin and a sponge, as shown in Fig. 3.

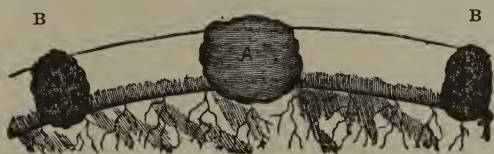


FIG. 3.—A, cancerous, gangrenous, or injured portion of intestine; B B, sponges with safety pins clamping the empty bowel on either side of the diseased or injured structure.

The general peritoneal cavity is shut off by flat sponges which have been rendered sterile and wrung out in hot saline solution, and the exposed portion of the bowel should be protected by the same means. The portion of the intes-

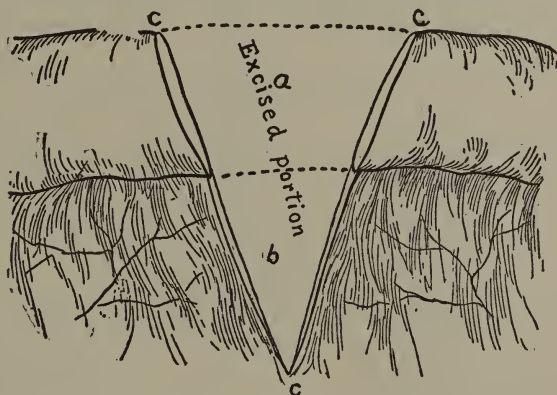


FIG. 4.—a b, portion of intestine and mesentery to be removed; b b, mesentery; c c c, lines of the incision.

tine to be removed is excised by means of a V-shaped incision having its apex in the mesentery, and its lateral borders on either side of the diseased point.

The mesenteric vessels are ligated before being cut by passing a needle armed with catgut around them, and tying



it, as suggested by Halsted; or they can be picked up and ligated as they are divided. The wound in the mesentery is closed by means of a continuous or interrupted suture, as seen in Fig. 5.

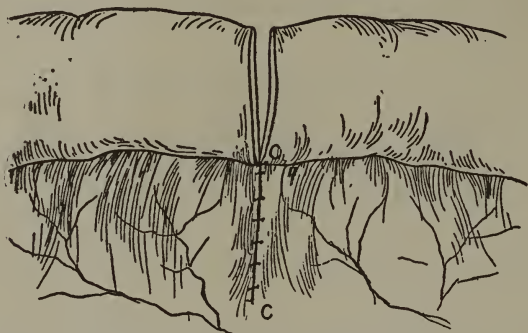


FIG. 5.—c c, incision in mesentery united by continuous suture.

After the divided ends of the intestine have been carefully washed with a hot saline solution, followed by a small quantity of a fifteen-volume solution of hydrogen dioxide,

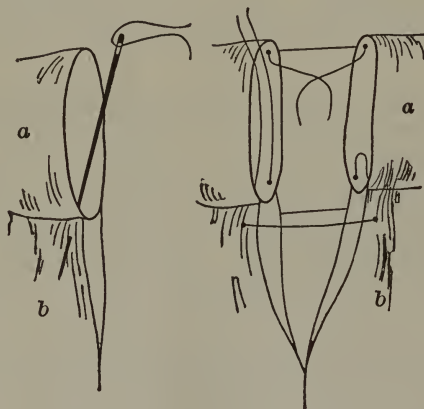


FIG. 6.—a a, segments of bowel; b b, segments of mesentery.

the proximal and distal ends are united primarily by means of two temporary sutures which are passed through all the intestinal coats, are tied, and the ends left long. The first suture is placed at the inferior or mesenteric border,

and is passed in such a manner as to include a portion of mesentery on both sides, as is shown in Fig. 6, and the second is placed directly opposite at the highest point of the superior border.

A longitudinal incision, an inch and a half long, is next made in the superior border of the larger intestinal segment, two inches from its severed end, by pinching up the intestinal coats between the finger and thumb, and dividing them with a narrow-bladed knife (shown in Fig. 7).

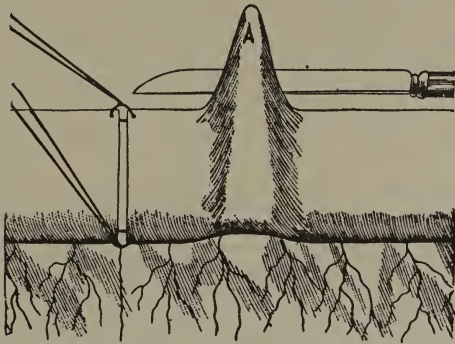


FIG. 7.—A shows the point of longitudinal incision made in the superior border of the larger intestinal segment.

Through this opening a forceps is passed, and the long ends of the temporary sutures are caught up and drawn back through the opening.

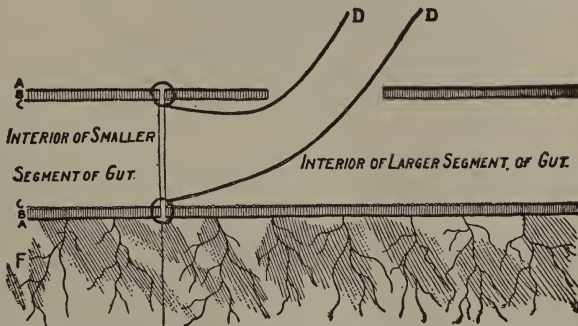


FIG. 8.—Longitudinal section of gut, showing A A, peritoneal coat; B B, muscular coat; c c, mucous coat; D D, temporary sutures passed into the bowel and out through the longitudinal slit made in the larger intestinal segment; F, mesentery.

By now drawing on these sutures, the ends of both segments of the bowel are invaginated and made to appear through the longitudinal incision as concentric rings. Figs. 9 and 10 show this to have been accomplished, and the peritoneal surfaces are seen to be in contact on all sides.

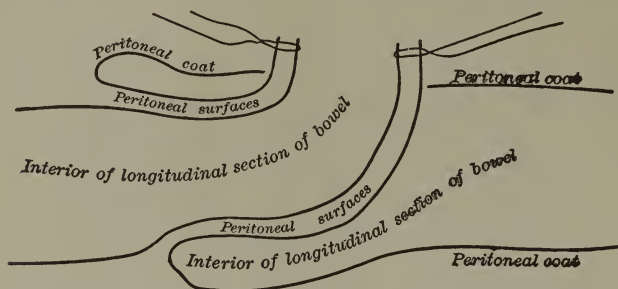


FIG. 9.—Longitudinal section of intestine, showing the relative position of the peritoneal coats of bowel invaginated at the longitudinal opening.

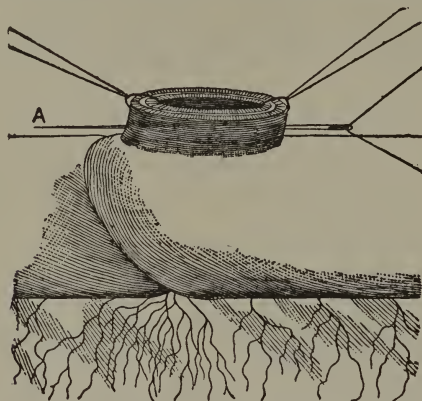


FIG. 10.—A shows the needle passed through both sides of the bowel and through all the intestinal coats, and shows that one passage of the needle places two sutures.

The ends of the long temporary sutures previously alluded to are held by an assistant while a fine, straight needle (milliner's No. 6), armed with a strand of horsehair, is passed through all the coats of the bowel and through both sides about a quarter of an inch from the divided ends.

The suture is caught up by forceps, divided in the middle, and tied at once on either side, thus avoiding the confusion that would result if all the sutures were passed before any of them were tied. This process is repeated nine times more, or until twenty sutures are placed and tied. The temporary sutures, having served their purpose, are cut off short. The cut ends of the bowel are dusted over with either iodoform or acetanilide, and the invagination is reduced by means of gentle manipulation accompanied by slight traction. The edges of the longitudinal opening are turned in, and it is closed by Lembert sutures passed through the peritoneal, muscular, and submucous coats.

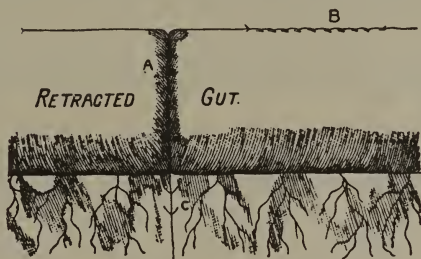


FIG. 11.—This figure shows the intestine after the completion of the anastomosis, and the reduction of the invagination. A, line marking the point of union between the ends of the bowel, showing that the peritoneal coat is well turned in, and that the sutures and knots are all inside the gut; B, longitudinal slit in the bowel closed by Lembert sutures.

Anastomosis of segments of ileum and colon may be effected by this method in the following manner:

A temporary suture is passed through all the coats of the greater and lesser intestinal segments at their mesenteric border, care being taken to adapt this border of either segment to the corresponding border of the other. This suture is tied and the ends left long. A second temporary suture is passed through the side of the larger segment at the point where the superior border of the smaller segment touches it, and through which the suture is also passed, tied, and the ends left long. A third suture is passed through all the coats of the highest free end of the larger

segment. The location of these sutures and the accurate adaptation of the mesenteric borders of the segment is shown in Fig. 12.

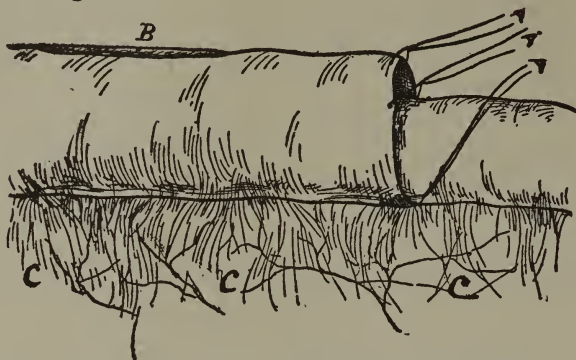


FIG. 12.—A A A, temporary sutures passed through all the coats of both segments; B, longitudinal slit made in the superior border of the larger bowel; C C C, mesentery.

A longitudinal incision is made in the superior border of the larger segment two inches from the divided gut. The ends of the temporary sutures are now drawn through this

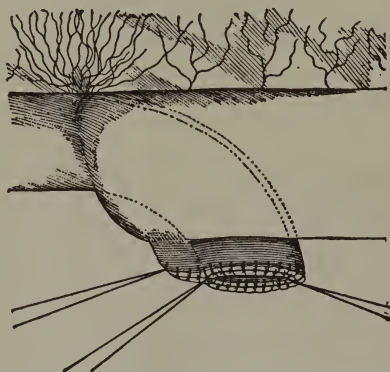


FIG. 13.—Diagram showing the union by invagination in a case where a decided difference in calibre exists between the segments of bowel to be united, and the method of suturing.

opening, traction is made, and the free edge of the larger segment is inverted and invaginated, being accompanied by the smaller segment which is only invaginated, and the free



edges of the intestine now appear in the longitudinal opening as concentric rings. If the difference of calibre between the two segments is great, a V-shaped portion of the convexity of the larger segment may be removed. This and the method of suturing are shown in Fig. 13.

The intussusception is reduced and the longitudinal slit is closed, as previously described.

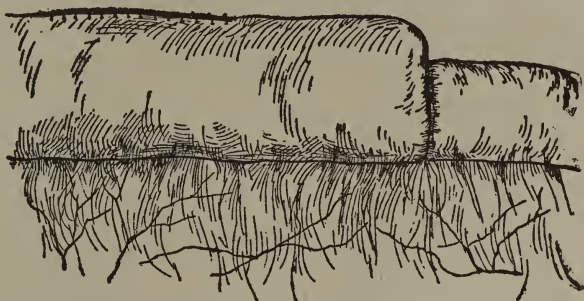


FIG. 14.—Diagram showing the segments after the reduction of the invagination, and the closure of the longitudinal incision in the superior border of the larger segment.

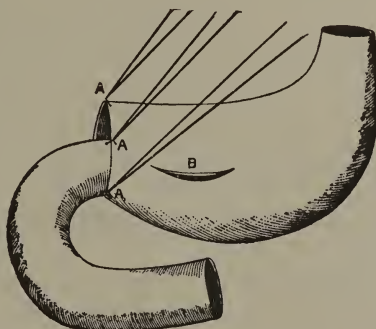


FIG. 15.—A A A, temporary sutures with the ends left long, uniting the cut surfaces of the stomach and duodenum; B, longitudinal opening in the stomach. Through this slit the free ends of the temporary sutures are passed, and by making traction on them the invaginated cut ends of both the duodenum and the stomach are drawn through the opening and the sutures placed from the inner side, as has been previously described.

*Gastro-duodenostomy or Gastro-enterostomy.*—Prior to the performance of operations on the stomach the patient is deprived of food for two days, and the stomach is cleansed

by several irrigations with an antiseptic solution during this interval. The patient having been anaesthetised and the abdomen opened by means of either a transverse or a longitudinal incision, Fig. 15 shows how, after pylorectomy, the duodenum may be united to the stomach by means of this method.

Owing, however, to the partial fixation of the duodenum, this method is only applicable to cases in which the growth is confined to the pylorus. When the disease is extensive, it is better to anastomose the jejunum to the stomach at a

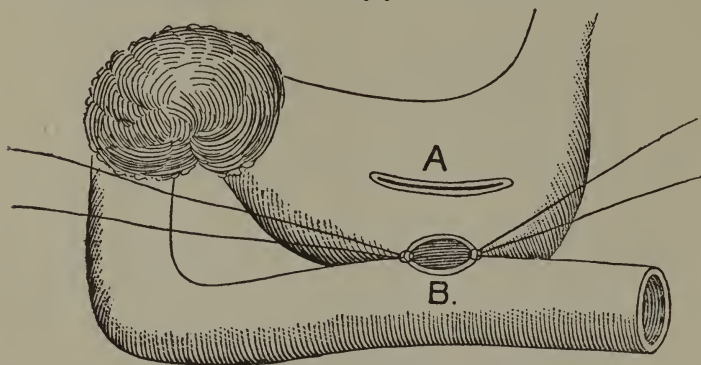


FIG. 16.—A, opening in the center of the stomach (where the vessels are very small) through which the cut edges of the corresponding openings, B (united by temporary sutures), made in the longitudinal axis of the upper end of the jejunum and in the line of the greater curvature of the stomach, may be invaginated and sutured in the usual manner from the inside.

point on its greater curvature. Gastro-enterostomy is performed as follows:

A portion of the jejunum, as close to the duodenum as possible, is drawn out of the abdominal cavity, emptied of its contents, and clamped. A portion of the greater curvature of the stomach is also drawn into the wound, and the jejunum is brought into contact with and united to it by several Lembert sutures in such a way that there will be as little strain as possible on the usual permanent sutures after they are placed and tied. A longitudinal opening, an inch and a half long, is then made in the superior border of the gut. The corresponding opening in the stomach should be an

inch above the greater curvature and parallel to it. The extreme ends of these wounds are now united by temporary sutures passed through all the coats of the stomach and intestine, and the sutures are tied, the ends being left long. An opening is now made near the centre of the stomach sufficiently long to allow of the invagination of the openings already made in both bowel and stomach. This having been accomplished, the openings are sutured in the manner already described, the needle passing through all the coats of the intestine and stomach. The invagination is reduced, and the slit in the center of the stomach is closed by means of Lembert sutures.

When the disease is located in the caecum or in the ileo-caecal valve, ileo-colotomy may be performed as follows, instead of in the manner previously described :

The diseased caecum having been completely excised, an opening is made in the side of the healthy colon two inches from its cut end ; into this opening the free end of the ileum is inserted. The temporary sutures are applied, tied, and brought out through the cut end of the colon, and, traction being made on them, the cut edge of the colon and free end of the ileum are invaginated and drawn through the free end of the colon. The sutures being applied in the manner previously described, the invagination is reduced. The free end of the colon is turned in to the extent of an inch, and the opening is closed by a row of Lembert sutures, care being taken to pass the needle through a few shreds of the submucous, as well as the peritoneal and muscular, coats, as advised by Halsted.

When the diseased caecum can not be excised, owing to the existence of firm and long-standing adhesions formed between this portion of the bowel, the right ureter, and the iliac vessels, ileo-colostomy should be substituted for ileo-colotomy. The diseased caecum and the ileo-caecal end of the ileum having been emptied of their contents, clamps are applied four inches on either side of the diseased structure. The ileum is divided. The end of the ileum which

is attached to the caecum is invaginated, and the opening closed by means of Lembert sutures. An incision is made in the convex surface of the colon large enough to receive the free end of the ileum, which is attached to the edges of the cut in the colon by the usual temporary sutures. An opening is now made in the colon two inches higher up, through which opening a forceps is passed and the ends of the temporary sutures are seized, and by their aid the free end of the ileum and the edges of the opening in the colon to which it has been attached are invaginated and drawn out through the upper slit in the colon. The permanent sutures are passed as usual, tied, and cut off short. The invagination is reduced, and the longitudinal opening in the colon closed.

An irreducible intussusception is treated in the manner

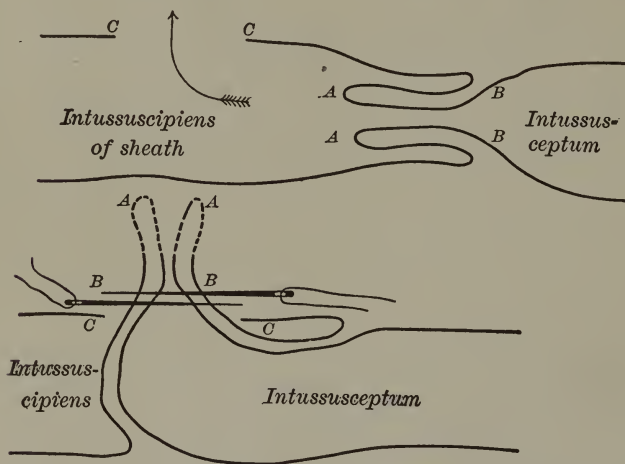


FIG. 17.—Diagram of longitudinal sections of intestine, showing an acute irreducible intussusception and the method of its treatment. C C, longitudinal opening made in the superior border of the intussusciens; A A, tip of the intussusceptum; B B, neck of intussusceptum.

shown in Fig. 17. A slit is made in the intussusciens and gentle traction made on the intussusceptum until its neck appears outside the opening in the intussusciens. The

base is then transfixed with two fine, straight needles armed with horsehair, and the intussusceptum is amputated a quarter of an inch above the needles, leaving a fair stump beyond them. The sutures are now passed through the invaginated bowel, caught up in the interior of the bowel, divided, and tied. The ends of these sutures are left long and used as retractors in place of the regular temporary sutures, while the other sutures are being placed and tied. This having been done, they are cut off short, the invagination is reduced, and the longitudinal slit is closed. The object of transfixing the neck of the intussusceptum previous to its amputation is to prevent it from retracting, and it also insures the maintenance of the proper relative positions of the different layers.

The various experimental intestinal anastomoses which in the past few years the writer has performed in accordance with this method, on dogs, have proved the following points in the techniques to be of consequence :

1. The longitudinal slit which is made in the segment of bowel having the greatest calibre (proximal or distal), and through which the invagination occurs, should be located at least two inches from the cut end of the bowel.

2. The mesentery of both segments must be included in the first temporary suture which is passed at this intestinal border ; this prevents sloughing of the bowel at this point.

3. The sutures should be placed at least a quarter of an inch from the cut intestinal edge ; they should be interrupted, about twenty in number, and should not be drawn too tightly when they are tied.

4. The best suture material for this work is carefully tested and prepared horsehair.

5. The needle best adapted to this work is a round, straight one (milliner's, Nos. 6 to 9).

6. The invagination, after the sutures have been placed, must be carefully reduced, rather by manipulation than by traction, otherwise the sutures may cut out.

7. In closing the longitudinal slit, too much of the intes-



tinal edges should not be turned in, or a contraction may result at this point.

The special claim of this method of intestinal suture to recognition and further practical trial, rests upon the lack of special appliances needed for its performance; its adaptability to every portion of the intestinal tract; the ease, rapidity, and safety with which an intestinal anastomosis can be effected by its aid; and the fact that no time need be lost in determining the direction in which the invagination should be made.

The objections made to this operation, which experience has proved groundless, are: First, that the sutures pierce the mucus as well as the other intestinal coats. This point Professor Maunsell considered an advantage, for he said, "Firmly suturing all the coats gives great healing capacity to the ends of the bowel, and the stitches are not likely to tear out." That this objection is not a valid one is proved by the fact that no failure to secure a good result has occurred from this cause, in any of the cases of which we have record where an intestinal anastomosis has been performed in accordance with this method, nor has there been the slightest evidence of leakage having taken place.

The second, and last, objection that has been urged has been the possible danger of cicatricial contraction causing stenosis at the point of union. This fear has proved, in the writer's experience, to be without foundation, the patient upon whom the writer operated (performing enterectomy with removal of six inches of the ileum for a perforation following an abdominal contusion) on September 12, 1893, having remained in perfect health, and free from bowel symptoms for more than two years. I now have the pleasure of presenting this patient to you. Again, on October 9, 1894, an intestinal anastomosis according to this method was performed by the writer on a dog, before the Litchfield County (Conn.) Medical Association. The dog made a good recovery, and remained in good health till April 23, 1895, when he was killed, and a necropsy performed before

the same association. The intestinal scar at the point of union was barely visible, there was no ocular evidence of contraction, and there were no intestinal adhesions.

It has from time to time been suggested that, after the sutures have been placed according to this method, and the invagination has been reduced, it would be wise to place as an additional safeguard, a row of Lembert sutures around the outer side of the bowel, uniting again the peritoneal coats of the segments. To this suggestion, Professor Maunsell replied in a letter to the writer, dated London, February 25, 1894, as follows: "A double line of sutures should never be applied in intestinal surgery. It obstructs the circulation too much, interfering with firm, plastic peritonitis, and in some cases causing gangrene of the inverted portion of the gut."

The writer has been able to collect the reports of eleven cases of intestinal anastomosis effected by this method of suture. Of these operations, nine resulted in the recovery of the patient, and two were followed by death, which could not, in either instance, be fairly attributed to the failure of the suture or the method of applying it.

The successful operations were performed by the following surgeons:

1. Frank Hartley, M. D., surgeon to the New York Hospital. Operation performed during March, 1892, and recorded in the *New York Medical Journal*, vol. lvi, pp. 302 and 464.

2. Mr. Stanley Boyd, F. R. C. S., surgeon to the Charing Cross Hospital, London. Operation performed November 26, 1892. Case recorded in the Transactions of the Medico-Chirurgical Society, London, vol. lxxvi, p. 345.

3. Frederick Holme Wiggin, M. D., surgeon to the New York City Hospital (Blackwell's Island). Operation performed September 12, 1893. Case recorded in the *New York Medical Journal*, January 20, 1894.

4. Mr. W. Harrison Cripps, F. R. C. S., surgeon to St. Bartholomew's Hospital, London. The case was reported,

and the patient shown to the London Medical Society at its meeting, November 12, 1894.

5. Mr. Keetly, F. R. C. S., surgeon to the West London Hospital. Case recorded in the *Lancet* for November 17, 1894, p. 1156.

6. Mr. L. A. Bidwell, F. R. C. S., surgeon to the West London Hospital. Case reported to the writer by Professor Maunsell, in February, 1895, and to the London Medical Society by Mr. Bidwell, March 25, 1895.

This gentleman has recently informed the writer that the operation was performed upon a woman, twenty-seven years of age, for a rupture of the ileum, which occurred in the course of an operation for the removal of an extra-uterine gestation sac of ten months' standing. In reply to the writer's question as to whether or not extra sutures had been employed to approximate the peritoneal coats after the reduction of the invagination, Mr. Bidwell writes: "The only modification, which I employed, was closing the longitudinal opening in the gut with Halsted's suture instead of Lembert's."

7. Dr. Emmerich Ullman, of Vienna. The operation was performed in December, 1894, only one row of silk sutures being employed. The patient made a good recovery. The case was recorded in the *Centralblatt für Chirurgie*, No. 2, 1895; also in the *Annals of Surgery* for August, 1895.

8. Mr. W. Watson Cheyne, F. R. C. S., surgeon to the King's College Hospital, London. Case unrecorded. The operation was performed on April 9, 1895. The following history of the case has been kindly furnished to the writer by Mr. Cheyne:

"Cancer of transverse colon; excision, Maunsell's method, and recovery. Female, married, aged seventy-two, admitted to King's College Hospital, March 27, 1895. Previous history unimportant. In July, 1893, had an operation performed for pain in the abdomen; nature of the operation not known; she says it was about the vagina. Previous to that she had suffered much pain in the right iliac fossa for

about eighteen months. She says she was cured as the result of this operation, but of late, pain has come back in the right iliac region, and symptoms of partial obstruction have set in more than once. When she was admitted, there was a condition of partial obstruction, but this improved somewhat before she was operated upon. On her admission, her abdomen was a good deal distended; nothing was felt *per rectum*; *per vaginam* the anterior wall of the vagina seemed scarred. On placing the hand on the right side of the abdomen, the coils of the intestine are readily felt, and great pain is at once felt as the result of the peristalsis set up under chloroform. A hard, oval tumor is felt about the umbilicus, which moves freely in the interior of abdomen. On April 9, the abdomen was opened, and a cancerous tumor of the transverse colon was found, together with enlarged glands in the meso-colon, and in the neighbouring omentum. The bowels were clamped by Maunsell's safety-pin method, and the disease was removed. Repair by Maunsell's method. Uninterrupted recovery. Patient well when I last heard."

To this Mr. Cheyne adds: "I found Maunsell's method very difficult in this case. The obstruction had evidently lasted a long time, and the longitudinal muscular bands of the intestine above were enormously hypertrophied, and formed rigid bands, and the difficulty of invaginating that end of the gut was extremely great. In a case of old-standing obstruction, I would not again use Maunsell's method."

9. Dr. Robert T. Morris, professor of clinical surgery in the New York Post-graduate Medical School and Hospital. The operation was performed in the writer's presence, on September 19, 1895. On October 11, 1895, Dr. Morris reported the patient's convalescence to have been uneventful.

#### UNSUCCESSFUL CASES.

1. Professor H. Widenham Maunsell. The operation was performed during December, 1886, and was recorded in the *Lancet* of February 13, 1892. It was the first operation in which this method was employed, and was for the relief of

intestinal obstruction, due to a carcinoma. The patient died on the sixth day, from exhaustion. The necropsy revealed perfect union of the segments of the bowel. There was no sign of leakage.

2. Dr. Parker Syms, surgeon to the Lebanon Hospital and assistant surgeon to the New York Cancer Hospital. The operation was performed on September 19, 1893. The patient died of septicaemia on September 22. In explanation of the cause of this patient's death, it should be stated, that, on September 5, 1893, Dr. Outerbridge, gynaecologist to the hospital, performed abdominal section for the purpose of removing a malignant growth which was low down in the pelvis, involving the entire circumference of the sigmoid flexure. The tumor was so adherent to the surrounding structures that it could not be removed. Therefore, the abdominal wound was closed; one layer of silk-worm gut sutures passed through all the layers. On September 15, an attempt was made to reach the tumor by means of Kraske's method of rectal incision, but after the posterior three quarters of the rectum had been freed from its attachments, the operation was abandoned. On September 19, Dr. Syms opened the abdominal cavity in the line of the cicatrix, which was found to be very firm. The abdominal walls could not be pulled apart, and the tissues had to be incised. The diseased portion of gut was with difficulty drawn into the wound, and three inches resected. The haemorrhage was profuse, and controlled with difficulty on account of the friability of the tissues. The ends of the gut were invaginated, and the sutures placed and tied, according to Maunsell's method. The latter procedure was difficult of accomplishment, as the sutures tore out easily. The patient's condition was poor, and the abdominal cavity was filled with salt solution. Prior to the performance of this last operation, the patient's temperature was 101° F. Following the operation, the temperature rose to 103.6° F. The sacral wound, Dr. Syms stated, had already shown signs of septic infection, and later it became gangrenous.



The patient died on September 22, 1893. No record could be found of the results of the necropsy, if one was made. Surely there was sufficient cause for the patient's death, aside from the possible failure of the intestinal anastomosis. Throwing out this doubtful case, we find that the method of intestinal suture, devised by the late Professor Maunsell, has in all the cases which the writer has been able to collect, resulted in a satisfactory union of the intestinal segments.

The writer, in concluding this article, wishes to acknowledge his indebtedness to Mrs. Maunsell for Figs. 12 and 14 and some notes found among her husband's papers after his demise; to Mr. Boyd for Fig. 6; to Mr. Cheyne, Mr. Bidwell, Dr. Morris, and Dr. Syms for the notes of their cases; and to the Messrs. Lea Brothers & Co., for electrotypes of several of the illustrations.

The following letter was furnished the writer by Dr. Robert T. Morris, professor of clinical surgery in the New York Post-graduate School and Hospital, who vouches for its authenticity:

BREMEN, ME.

In the latter part of January, 1832, we had a calf about six months old that got hooked in the flank, and for a week or more we were doubtful whether it had caused a breach or not, but finally ascertained it had, and concluded to kill her, but wanted, like Felix, to wait for a "more convenient season," as we were very busy. About eight or ten days after this, on going to the barn, I found that the manure was coming out of the breach, and decided the time had come to kill her, but while taking breakfast, and thinking it over, I made up my mind to try an experiment.

Accordingly, I prepared myself with a tailor's palm needle, and cotton twine, well waxed with bees-wax, and a sharp knife and set about the work, first tying her legs, and raising the hind parts above a level, so as to let the inwards settle away from the breach, then cut across the breach in this form  $\perp$ , leaving four corners, which I skinned back from the breach. Then came the "tug of war," for the inwards came bursting upon me, discharging, I should think, nearly a peck besmeared with blood, and it seemed impossible to get them back, but, on letting her down, with the idea of putting an end to her misery, they did not seem to press so

hard outwardly, and we concluded to try again, and get them back in place. We then found that they had healed on to the film ; we then fleeced them off from that with the thumb-nail, and then found where the gut was broken off—rotted off—leaving a mere string to hold it together ; we then procured a fine needle and silk, together with a candle, which we cut in two, and the gut was hauled over the same, bringing both parts together, and then cutting off both ends, as they were diseased, bringing the newly cut parts together, sewing them fast, and then putting them back in place sewed up the film with a whip stitch, then drew the corners together, taking a stitch to each two corners and tying them, and the work was done. Her legs were untied, and she got up herself, ate and drank nothing for three days, and then began to eat and drink moderately, and the sixth day, to my joy, the wick of the candle passed off through its natural passage, and she was as good as any of the lot.

WARREN WESTON.

## A REVIEW OF TREATMENT AND RESULTS IN NINE CASES OF FRACTURE OF THE FEMUR.

By DOUGLAS AYRES, M. D., of Montgomery County.

*October 17, 1895.*

Fractures of the neck of the femur are among the most intricate of all the forms of fracture that the surgeon is called upon to treat. The late Dr. Hamilton says in his work on Fractures and Dislocations: "In no other fractures do the predisposing causes play so important a part as in fractures of the neck of the femur; and this whether within or without the capsule; indeed experience has shown, that without the concurrence of those pathological changes which usually accompany old age, these fractures can scarcely occur."

The cases which I present in this paper range in age from thirty to eighty years, and as to location of the fractures, one in a young man thirty years of age was plainly extra-capsular. As to the others, attempts were not made to clearly determine for reasons which will appear as I proceed. They were all (as I shall point out in giving a short history of each case) caused by a blow received upon the trochanter major, either upon the posterior portions, or directly upon its outer surface, and the sameness of the manner in which the violence was received in each case seemed a somewhat peculiar coincidence. And the fact that seven out of the nine were women would add to the verification of the tabulated reports to prove that they suffer more frequently from this accident than the opposite sex. In giving the history of those cases I shall call particular attention to the results, especially in the aged. All made good recoveries with fairly useful limbs. My chief object in presenting them is to urge only the slightest manipulation in endeavouring to arrive at exact conclusions as to whether the fracture is within or without the cap-

sule. The knowledge can be of no personal benefit to the patient or practical importance to the surgeon. He certainly would follow the same course of treatment in either case; and the results of such manipulations as would be necessary to satisfy him of the exact location might greatly lessen the chances of the patient for a useful limb. After all the discussion as to the relative frequency of the two forms of fracture, by Sir Astley Cooper, Malgaigne, Nelaton, and Bouret, and the records of hospitals and cabinet collections abroad, and in our own country, the question is still undecided. Undoubtedly in a matter of this kind, where clinical evidences are always uncertain, the most reliable knowledge must necessarily be gained from cabinet collections where the evidence is beyond dispute. The physical evidences which are presented to the surgeon called to a case of this form of fracture, are usually sufficiently characteristic to enable him to determine the true nature of the difficulty, namely, shortening to a greater or less extent, eversion (usually), loss of function, etc. I am always very careful to measure accurately both limbs from the anterior superior spinous process of the ileum to the inner malleolus. Then as to where the fracture has occurred, whether in the shaft or neck, I think it best determined by discovering the relation of the trochanter to Nelaton's line, or Bryant's ileo-femoral triangles, and comparing with the opposite side. Then to aid us further in differential diagnosis from luxation, we have the history of the manner in which the accident was received, and the age of the patient, especially the latter; tabulated reports showing that the great majority of cases of luxation occur before the fiftieth year, and those cases usually in men, who are liable to be exposed to greater violence. Then each of the four general forms of luxation will present sufficiently characteristic symptoms to indicate their true nature. By these means we can obtain a very correct idea, and escape the danger of doing harm by manipulation. And further, knowing that there is very frequently impaction of the fragments, either at the small part of the neck, or at the base; and that a portion at

least of the periosteum may remain untorn, to render its aid in keeping the parts in apposition, how important it must be, when so great an amount of leverage must necessarily obtain by the attempt to detect crepitus, to refrain from it. Immobilisation from the beginning has seemed to me to be the most important factor in preventing separation, and thereby greatly increasing the chances for a firmer union and more useful limb.

CASE I.—February 10, 1881, was called in the early part of the evening to see Mrs. D. W., aged sixty-four years; tall and slender in form. Her family gave me the following history: About one hour before, while on the way to church, her right side came in contact with a post which leaned slightly over the walk, and caused her to fall heavily upon the right hip; she found herself unable to rise. She was taken up very carefully, placed in a carriage, and taken to her home, a few blocks away. The following symptoms were present: Eversion of foot; little pain at rest, but great pain upon the slightest movement. About one third of an inch of shortening by accurate measurement. Trochanter slightly higher than that of the opposite side by reference to Nelaton's line and a trifle less prominent. The patient was placed upon a firm bed, and limbs immobilised by sand bags, with no extension. The following day found her very comfortable, with no tendency to shortening. She bore her confinement well. Sat up for the first time about eight weeks from the time of the accident; began to walk with crutches in one week more. I saw her quite recently. There is but slight eversion of the foot; limb about one inch shorter than its fellow, but she walks very nicely with a raised heel.

CASE II.—June 11, 1883, was called to see Mrs. B. F., aged seventy-two years; of very slender form, who had fallen upon the kitchen floor, striking upon her left hip, about one hour before I saw her. She complained of a good deal of pain, upon the slightest movement. Symptoms present, eversion of the foot, with one quarter of an inch shortening. Trochanter not markedly higher than the opposite. Diagnosis in each of these cases fracture with impaction. No dressing but the sand bags. Bore her confinement well. Was allowed to sit up at the end of six weeks, and to go about on crutches in two weeks more. Result: slight eversion of the foot. About one inch of shortening after a few months, but walked well with a cane.



CASE III.—July 8, 1883, was called to see Mrs. J. M., aged eighty years, and very fleshy, yet active for one of her years, and able to do quite a little work in the household. Her granddaughter gave me the following history: About two hours before I saw her she was walking in her kitchen when she slipped upon an apple peeling and fell, striking upon her right hip. She was unable to rise, and was carried carefully and placed upon her bed. I saw her three hours later. She begged me not to touch the limb, saying that there was great pain upon the slightest movement. The symptoms present were eversion of the foot, and about one inch of shortening. Diagnosis: Fracture of the neck, probably impacted. No other dressing but the sand bags. I gave the family a very unfavourable prognosis, but the old lady (much to my surprise) made a very good recovery, and was able to get about with her crutches in three months with one inch and a half of shortening.

CASE IV.—June 8, 1884, was called to see Mrs. R. B., aged seventy years, of spare form and medium height. Her daughter gave me the following history: She had just taken dinner, and was going into her sitting room, when she caught her foot in some matting and fell, striking her right hip upon the floor. I saw her shortly after and found her lying where she had fallen. Moved her carefully to her bed and made an examination; found eversion of the foot and great pain with the slightest movement, shortening one inch, trochanter higher than its fellow. Diagnosis: Fracture with impaction. Made use of extension in this case. Extended with weight and pulley, making very careful trial as to the amount of weight easily borne, about three pounds sufficient, patient saying that she felt very comfortable with it. Used sand bags to keep limbs in position. Counter extension by raising the foot of the bed. This patient made quite a rapid recovery: was able to sit up in seven weeks, and shortly after walked by the aid of crutches. After a few months walked very well with but slight eversion of the foot and about one inch of shortening.

CASE V.—August 4, 1885, was called to see Mrs. C. S., aged sixty years, tall and slight, who gave me the following history: Had fallen one hour before I saw her upon the uncarpeted floor, striking upon her left hip; could not rise, but managed to reach her bed (having no one to help her), which was fortunately in the same room. I saw her two hours after. I found eversion of the foot, and limb shortened about one half inch. There was no pain

while the limb was at rest, but severe pain upon the slightest movement. Treatment consisted simply in making use of sand bags to keep the limb in position. Patient made a good recovery : was allowed to get up at the end of eight weeks. Result: She walks very well, with about the same degree of eversion of the foot found at the time of the accident. She does not hesitate to walk three or four miles frequently. Shortening at this time about one inch.

CASE VI.—December 6, 1886, was called to the house of Mrs. M. M., aged thirty-nine years, of short and stout form. Her husband gave me the following history of the accident: About one half hour before I saw her she had stepped out to remove some clothes from a reel in her yard, and while in the act of removing them she stepped upon some ice and fell heavily upon her left hip, and found that she was not able to rise. She was carried carefully into the house and placed upon a couch, where she lay when I arrived. Symptoms: Placing the limbs together, with body perfectly straight, there was observable shortening of the injured limb and eversion of the foot. By measurement from anterior superior spinous process to inner malleolus found one quarter inch of shortening; also about the same from the umbilicus. Trochanter of the injured side less prominent than its fellow, and occupying a somewhat higher position with reference to Nelaton's line. She complained of great pain upon the slightest movement. Treatment: It was my judgment that slight extension only would be necessary. I therefore applied a well-padded Liston splint and perinaeal band, with only enough of extension to keep the parts steady. Sand bags were used at the sides of the splint. At the end of six weeks this patient was allowed to rise, but restoration of the functions of the limb came slowly. She walked with crutches about eight months, after which she walked without aid and with scarcely any perceptible limp and but slight eversion of the foot. Shortening after two years only about one half inch.

CASE VII.—March 28, 1887, was called to see Mr. W. S., aged sixty-four years, of slender form. The family gave me the following history: About two hours before, while unloading furniture upon a platform (raised a few feet from the ground) from a lumber wagon upon the wheel of which he was standing he slipped, heavily striking his right hip upon the edge of the platform. He was unable to rise, and was carried to the bed where I found him. The following symptoms were present: Eversion of the foot,

shortening by comparison of the limbs, amount by measurement one and one half inches. Trochanter less prominent and markedly higher than its fellow. I decided to dress with weight and pulley; found four pounds produced sufficient traction to draw the bone to about its normal position, and the weight well borne by the patient. Completed the dressing with long side splint as a guide with transverse foot piece. Elevation of the foot of the bed for counter extension. He bore his confinement well. Weight removed the sixth week, but kept the patient in bed until the seventh, when he began to sit up. He did not try to use crutches until the ninth. Result: After two years he walked very well with not very marked eversion of the foot, and about one inch of shortening of the limb.

CASE VIII.—February 7, 1887, was called to see Miss E. P., aged forty-five years, tall and rather stout in form. The sister gave me the history of the accident. Said that she was moving from a neighbouring village with a load of household furniture by team and wagon, and was sitting on a high spring seat when the wagon jolted and caused her to lose her balance, when she fell, striking her right hip upon the wheel, thence upon the ground. Was unable to rise, and was placed in a carriage and taken to her destination. I saw her a few hours after the accident. Symptoms present were eversion of the foot, extreme pain upon the slightest movement; shorter by comparison than its fellow, shortening by measurement one inch. Trochanter as shown by Nelaton's line higher than its opposite. Dressed with weight, pulley, and guide, etc. Found about six pounds necessary to keep it well down. Removed the weight at the end of six weeks. She walked with crutches at the end of two weeks more. Did not recover the use of the limbs readily, it being nearly four months before she could walk fairly well. Result: After two years but slight eversion of the foot, about one half inch of shortening, and could walk without perceptible limp.

CASE IX.—January 2, 1893, was called to see Mr. F. H., aged thirty years, of tall and muscular form. The history of the accident was that he was walking upon a sidewalk covered with ice, when he slipped and fell, striking upon his right hip. He was unable to rise and was carried to his home a few blocks away, where I saw him one hour later. Symptoms present were eversion of the foot and marked shortening by comparison, but little pain. Found about one inch and a half of shortening by measure.

Trochanter flattened and higher than opposite side, etc. Dressed with weight and guide and usual elevation. Found eight pounds necessary to produce sufficient traction. The weight was removed and the patient allowed to rise at the end of six weeks; the seventh he began to walk with crutches carefully, and could walk very well with them in one week more. Result: About one quarter of an inch of shortening by recent accurate measurement. No eversion of the foot and no perceptible limp.

Condensing these several cases in tabular form gives the following summary:

Age.	Sex.	Nature of accident.	Amt. of traction.	Shortening immediate.	Ultimate.
64	Female	Fall upon floor, striking hip.....	0 lb.	In. $\frac{1}{3}$	In. 1
72	Female	Fall upon floor, striking hip.....		$\frac{1}{4}$	1
80	Female	Fall upon floor, striking hip.....	0 "	1	$1\frac{1}{2}$
70	Female	Fall upon floor, striking hip.....	3 "	1	1
60	Female	Fall upon floor, striking hip.....	0 "	$\frac{1}{2}$	1
39	Female	Fall upon ice, striking hip.....	List in splint.	$\frac{1}{4}$	$\frac{1}{2}$
64	Male	Fall upon platform, striking hip.....		$\frac{1}{2}$	1
45	Female	Fall upon wheel, striking hip.....	6 "	1	$\frac{1}{2}$
30	Male	Fall upon ice, striking hip.....	8 "	$1\frac{1}{2}$	$\frac{1}{4}$

From this table it will be seen that four were treated without extension, and five with. That those treated without extension were women,—the youngest sixty, and the oldest eighty years of age. In these cases the greatest ultimate shortening was three quarters of an inch in one case, and from one half to two thirds of an inch in the others. Of those treated with extension, three were women from thirty-nine to seventy years of age, and two were men, aged respectively thirty and sixty-four years. Of these cases, one as to ultimate shortening remains the same (one inch). Of the remaining four, two were shortened one half inch; one, one inch; and one, one quarter inch.

In conclusion, I will recapitulate in the following:

1. That it is not usually difficult to diagnosticate a frac-

ture of the neck of the femur, but much more difficult to locate its precise position.

2. That the question of exact position is of no practical importance, and one which if definitely known in each individual case would not require any variation in treatment.

3. Avoid as much as possible all manipulation, and be guided in diagnosis, by the position of the foot, by careful study of differential diagnosis from dislocation, especially (if there be much shortening and you extend to normal position), to observe if the displacement recurs, whether slight or great prominence of the greater trochanter, and its location with reference to Nelaton's line.

4. As a corollary, where there is great doubt as to the kind of injury, that is, whether fracture really exists, especially at the age when very slight force produces it, give the patient the benefit of the doubt and immobilise until you are satisfied from results of the true nature of the difficulty.

5. As to treatment, study carefully each individual case, and be guided by the age and general condition as to the question of extension. If there be very marked shortening in the aged, and it be found that it can be easily restored, moderate extension I think advisable as long as it is well borne. In the younger, extension should be the rule.

These are points which I think are worthy of our consideration, and if followed will enable us to obtain better results than by making persistent effort to arrive at an exact diagnosis.

#### DISCUSSION.

Dr. DELPHY, of New York county, asked as to the amount of pain in these cases.

Dr. AYRES replied that there had been extreme pain on the slightest motion, and that the pain had subsided shortly after immobilisation.

Dr. DELPHY said that having broken the fourth metacarpal bone of his left hand he had found that by slightly extending the finger for a few minutes there would be a relief from pain, and that this would last for from two to five hours.



Dr. AYRES said that the pain was produced by moving the limb only. In the lady of eighty years, no attempt was made to treat the case except by immobilisation. In another case where there was very little shortening, as the pain was only experienced on rotation, he had thought the sand bags sufficient as he judged that in these cases extension might serve to break up the impaction.

## A SLIGHT IMPROVEMENT IN THE ALBION STETHOSCOPE.

By SIDNEY YANKAUER, M. D., of New York County.

*Read by title, October 17, 1895.*

The most compact and convenient stethoscope in use at the present time is known as the Albion stethoscope. It consists of two rubber-tipped metal limbs connected by two soft rubber tubes with the chest-piece. The latter has a conical cavity at the chest end, which leads to a narrow neck, from which two bifurcations arise. In the interior, at the junction of these two bifurcations, is a sharp spur, which divides the column of sound into two parts.

As the stethoscope is usually manufactured, the neck has a diameter of three thirty-seconds of an inch, while the diameter of each of the limbs is considerably larger. The column of sound which is collected from the area included by the rim of the chest piece, one and one eighth inches in diameter, passes through the neck, and then enters the limbs, whose combined areas are very much larger than that of the neck. Now, the sound must undergo concentration; for the limbs of the stethoscope cannot have a bore larger than the external auditory canal. But to cause the whole column of sound to pass through a neck much smaller than any subsequent part of the conducting tubes, is unnecessary and injurious; for the greater the concentration, the greater the number of reflections from the wall of the conical cavity, and hence the greater the opportunity for the interference of sound waves.

The improvement, therefore, which I have made in the stethoscope, is to enlarge the neck of the chest-piece, so as to make its area equal to the sum of the areas of the two

limbs. Such a chest-piece was made for me by Messrs. Tremen & Co. The sounds of the heart and lungs, with this chest-piece, are much more distinct and clear, and even somewhat louder, than with the old one; and their quality approaches much more closely to the quality of the sounds as heard with the ear directly, without the intervention of any stethoscope.

## DISEASE OF THE ANKLE-JOINT.

By THOMAS M. LUDLOW CHRYSTIE, M. D., of New York County.

October 17, 1895.

The ankle-joint is defined as a ginglymoid articulation. From a clinical standpoint, however, this articulation is not confined to the hinge-like motion characteristic of the other large ginglymoid joints of the body, the elbow and the knee, but permits of a distinct lateral motion of the foot upon the leg. We find differences in their construction accounting for this, and making the comparative study of these three joints of value when either of them are injured or diseased.

1. As to their osseous construction. At the elbow and at the knee, the upper and the lower—the proximal and the distal—surfaces of the articulation are each formed from the broadened extremity of a *single* long bone; the opposing surfaces presenting concavities and convexities respectively fitting and locking into each other, thus completing the simile of a hinge. The more slender companion long bones are unimportant in the ginglymoid function, because the fibula is not concerned in the construction of the knee at all, though affording a point for the attachment of important ligaments; and because the flat end of the radius is used as a surface for the rotation on its long axis, its abutment upon the external condyle of the humerus in this manner obtains for the purpose of rotation alone. The ginglymoid motion of the elbow finds ample security in the large depression offered by the sigmoid, semilunar-shaped cavity of the ulna, as it receives the opposing trochlear surface of the humerus.

On the other hand, the ankle-joint presents as its upper articular surface an arch formed from the ends of *two* long bones—the tibia and fibula—instead of from one bone, as

in the case of the knee and of the elbow. Such an arrangement of itself produces for the joint less of a ginglymoid function than would be the case if the two sides of this arch, the outer and inner malleoli, sprang from one bone. The *lower* articular surface of the ankle-joint is formed from a small, irregularly-shaped, oblong bone—the astragalus; its length, or long axis, being parallel to the surface of the joint, instead of at right angles, as in the case of its opposing bone of this articulation, the tibia. The astragalus articulating with and resting upon the calcaneum, a larger bone than the astragalus, it is true, but small and short compared to the lower articulating bones of the elbow and knee-joints; and its length, as in the case of the astragalus, is parallel with the articular surfaces of the ankle-joint.

This arrangement of the length of the lower bone at right angles to the length of the tibia, allows leverage for the movements of the foot in lateral directions. The arch of the superior articular surface of the ankle-joint reaches downward nearly to the level of the inferior articular surface of the astragalus, so that from a clinical and architectural view the calcaneum is the lower articulating bone of the ankle-joint, and the astragalus may be considered as part of the tibia. For in addition to this form of construction, a part of the flexion and extension of the foot upon the leg occurs at the astragalo-calcaneum articulation; and at this articulation also occurs some of that eversion and inversion of the foot which obtains independent of the rotation from the hip-joint.

2. As to the arrangement of the ligaments and the muscles or tendons of the ankle-joint, the functions of which cause them to play the part of a bolt which holds together the two portions of a hinge: The difference in the muscular action exerted at the ankle-joint from that of other ginglymoid joints, consists in the change of direction made by the tendons as those belonging to the extensor muscles of the ankle-joint travel behind the external and internal malleoli, and those belonging to the flexor muscles



travel in front of the ankle, changing at those points from a vertical to a horizontal direction. This adds greatly to their power, as when a rope travels over the wheel of a pulley; but if the power is not symmetrically exerted on each side of the foot, there is added to the uneven disposition of the osseous articulation, a tendency of such lateral placing of the tendons to twist the foot and wrench the ankle-joint. In proportion as the foot is placed out of a position at right angles to the leg, and so lessens the leverage for the power of the gastrocnemius to help steady the ankle-joint, to that extent its lateral steadiness is weakened. As to ligaments, the ankle-joint does not possess any ligamentous strength within the articulation, as is afforded to the knee-joint by its crucial ligaments; and to resist the force of an unexpected twist or lateral force, the three ligaments of the anatomical ankle-joint are of but little use unless protected by muscular action. The same may be said of the three ligaments of the clinical ankle-joint, the calcaneo-astragaloid, an arthoidal, or gliding, articulation.

Ankle-joints and tarsal articulations differ very much in different individuals as regards their firmness and lateral steadiness, and I doubt if there are any two pairs of ankles alike in this respect, taking in consideration that the ankle-joint is composed of two articulations as above mentioned. This variation runs from an absolutely solid tarsal arch without any perceptible movement in the calcaneo-astragaloid articulation, down to a type of extreme flexibility approaching flat-foot. Either extreme is a defect in structure. Those of the first variety I have found most frequently the ones presenting disease of the ankle-joint, and I have thought that these cases sustained a partial or entire rupture of the ligamentous tissues most easily, because of their unyielding character and the habit of the individual to depend upon this characteristic of the ankle for its steadiness rather than upon the elastic and more natural protection from muscular action. The ligaments giving away partly or wholly, there is a bruising of the articulation held

together thereby, with the consequent pain and possibly serous effusion. Later, periostitis and necrosis may become established. If adequate mechanical protection from twist or wrench is provided to the diseased ankle, a useful foot can be obtained, even if in part permanently damaged.

We may assume that disease of the ankle-joint is due to an injury. I have never seen a case in which the inception of the disease was not traceable to either a severe wrench, blow, or twist; or to a series of slighter traumatisms repeated at intervals, and occurring at each time before complete recovery of the structure and function of the joint had obtained. From the histories of cases contained in the literature upon the subject I draw the same conclusion.

But in making a prognosis and planning a course of treatment we must ascertain what sort of a diathesis the patient presents; whether cancerous, syphilitic, rheumatic, tubercular, or a healthy diathesis, is present; for we are apt to find either of these present in diseases of the bones and joints. In the first-named diathesis, early removal of the offending structure is the only remedy. In the next three, appropriate therapeutic measures are essential, not only with the idea of combating the dyscrasia by means of specific drugs if necessary, but more particularly by putting the system under a training diet and discipline suitable to the condition of the patient. This does not generally receive the proper attention, as it should be watched and varied at intervals over a long period of time; or, receiving the attention, it is too much relied upon to procure a cure of the disease at the ankle-joint in the tubercular diathesis: in this class of cases, and in the healthy diathesis, the true germ of the disease at the ankle-joint is the constantly repeated twist or wrench, or, what is as injurious to the nutrition of the affected structures, the dread of such twist. Protect the ankle-joint from such traumatism by mechanical means on the line of the anatomical arrangement of the joint, and do so without interfering any more than is necessary with

its function, and you remove, or scrape out, so to speak, the germs of the disease; not a living germ, to be sure, but one which has a vast influence on the chemical process called nutrition.

Of the mechanical means, I use a steel shoe, made to fit the side and bottom of the foot; this is secured to a bar having a carefully made joint, and on this joint and the bolt which carries it, depends the efficacy of the treatment; the bar is secured to a steel plate fitting the side of the leg; there are appropriate straps around the leg and tarsus to retain the foot in the brace comfortably. Plaster of Paris may answer for a temporary purpose, but by its constricting influence it interferes too much with the nutrition of the limb, and after the necessary amount of rest is secured it offers no further means of permitting a restricted use of the foot. A stop at the joint of the brace to limit the motion at the ankle is generally required, and also to overcome or prevent retraction of the gastrocnemius muscle. Except the more advanced cases, the patient can walk on the foot with the steadiness afforded by the brace above mentioned, and with benefit. Where it is necessary to take the weight from the foot, I take care that the limb is not made pendent, but that the foot is permitted to rest upon the floor. Discharging sinuses are given free drainage by keeping the exterior opening free from granulations and patulous; tannin, aristol, or plain cosmoline, used as may be necessary, are efficient remedies. As the external malleolus is most frequently the part of the ankle proper to be diseased, the apparatus is generally adapted to the inner side of the leg. The foot must be protected at night as well as day from any twist or wrench, and for cleanliness and efficiency a brace for the night and another for the day is necessary, the night brace permitting a smaller extent of flexion and extension than the day braces. If a roller bandage is needed to control the swelling of the parts, flannel is preferable to cotton.

## SOME FRACTURES AND EPIPHYSEAL SEPARATIONS OF THE UPPER EXTREMITIES IN CHILDREN.

By JOHN F. ERDMANN, M. D., of New York County.

*October 17, 1895.*

In considering the subject of fractures of the upper extremities of children, it is not the intention of the writer to enter into the classification of fractures, so well understood already, but to present instead some cases, with their means of diagnosis and treatment.

Considerable has been written upon simple fractures in children, but comparatively little upon the subject of epiphyseal separations. It is this latter subject that will be largely dealt with, particularly those occurring at the shoulder, elbow, and wrist joints. Although fractures in children are usually considered green-stick, or incomplete, the individual work of the writer in this class of cases, both on the living subject and the cadaver, leads him to believe that the majority of these cases are complete fractures with no displacement. This is due to the dense periosteum found in the young acting to a great extent as a fibrous splint.

During the past summer the long bones were fractured in all situations with varying force, and upon dissection in the majority of cases it was found that the fractures were complete, but held firmly by the periosteum that remained intact, while in a few cases only there were a few bony bands of connection between the two fragments.

Owing to the greater elasticity of bones in children, due to the vascularity and less compactness, the bones are able to withstand a greater relative amount of violence, without sustaining fractures, than those of adults, in whom the bone

is more compact, less vascular, and supported by a thinner layer of periosteum.

#### CAUSES.

In the greater number of cases reported in this paper the injury was the result of a fall from a low chair, or out of bed. The well- and ill-nourished suffered about equally. In several instances it was found that one of the patients had suffered from one or more fractures. The season of the year has no relative influence in these cases. Age is a predisposing factor only when considering the diagnosis of epiphyseal separations. As a predisposing factor, we are well aware that the epiphyses can be separated from the diaphyses by trauma and disease up to eighteen or twenty years.

#### ANATOMY.

The upper epiphysis of the humerus unites with the shaft at about the eighteenth or twentieth year, and consists of the tuberosities and the head. The line of epiphyseal union corresponds internally with the lower margin of the articular surface of the humeral head. The lower epiphysis unites with the shaft about the sixteenth or eighteenth year, and the line of union is such that most separations take place backward. In the lower end of the radius and ulna the epiphyseal union takes place about the twentieth year.

#### FRACTURES OF THE CLAVICLE.

There are four cases of fracture of this bone to report, two of which were seen some ten days after the injury, with a history of a fall, slight pain over the clavicle upon manipulation, and inability on the part of the patients to use the arm as usual. Also that immediately after the injury was received nothing diagnostic of fracture of the clavicle was to be observed. After the eighth or tenth day either a mass or overriding of the fragments was found. Two of these cases were seen shortly after the injury, *i. e.*, within a few hours to a couple of days. In these latter cases nothing was



found except the sensitiveness or pain at or near the seat of the injury, and upon asking the child to take some object held upward and outward from the shoulder, but feeble attempts would be made. With the history of the first two cases a diagnosis was made of fracture of the clavicle, and so treated. Upon the patient's return in each of the latter cases, in the second week following the injury, a nodule of callus was found over the original site of pain, thus verifying the diagnosis.

In the cases of deformity, reduction was followed by the application of a bandage, to retain the fragments in proper position. In cases where no deformity was present, the bandage was placed upon the patient to prevent the laceration of the periosteal splint, and making a complete fracture in case a few bony bands remained intact at the time of the injury. The dressings were removed in three weeks, in each case, at the latest, and upon examination, firm union and good results were found.

CASE I.—A. G., three years of age, girl, was knocked down four or six steps by the slamming of a door, on September 2, 1894; complained to her parents of pain, especially so when she made efforts that required abduction and extension of the arm. She was treated for a sprain for several days. Examination revealed a slight deformity over the junction of the outer and middle thirds of the right clavicle, with considerable pain upon pressure, and no ecchymosis. Diagnosis: Fracture of the clavicle. Treatment: A flannel bandage to retain the reduced fragments. Discharged, with excellent results, on September 28.

I am indebted to Dr. W. H. Guilfooy for this case.

CASE II.—M. Van W., aged three, girl, fell from an ordinary chair on August 28, 1894, striking directly upon her right shoulder. She was seen September 8, twelve days after the injury, having been treated during these twelve days for a dislocation of the sternal end of the clavicle.

For the first ten days she gave evidence of pain, as in Case I, and on the night of the 11th a prominence was noted by her parents and the family physician. Examination revealed an overriding at the inner and middle thirds of the clavicle, pain, and ecchymosis.

This case was treated exactly as Case I, and was discharged in twenty-one days, with a slight prominence that was supposed, from its shape, to be callus.

CASE III.—A. K., aged five and one half, on May 17, 1895, was knocked down, falling on her right shoulder. For three days she complained of pain near her right shoulder, especially while being disrobed or lifted into bed. Her mother also noticed that she reached very gingerly for her food.

She was seen on May 20, three days after the injury. Upon examination, no deformity was present, but pain, upon pressure over the clavicle and also upon abducting and extending the arm, was found. Having the histories of Cases I and II in mind, diagnosis of fracture of the clavicle was made. Treatment: Same as the previous cases.

June 3, or fourteen days after seeing her, there was an ovoid mass at the original site of pain that was diagnosticated as provisional callus. This mass disappeared within three weeks.

CASE IV.—M. W., two years of age, fell out of bed June 29; could not use her left arm in play, owing to pain near her left shoulder. Examination revealed only pain upon pressure over the outer and middle thirds of the clavicle, and also pain at this point when she made an effort to grasp anything held above her head. Diagnosis: Fracture of the left clavicle. Treatment: The same as in the preceding cases.

July 15, small mass near the original site of pain, and on August 12 discharged, cured.

Throughout the remainder of this paper only epiphyseal separation of the upper and lower ends of the humerus, fractures of the lower end of the humerus, and epiphyseal separation of the radius and ulna in their lower extremities will be considered.

Epiphyseal separation of the upper extremity of the humerus does not occur later than the twentieth year, owing to the union of the epiphysis with the shaft about this period of life. The average age in these cases, according to Tubby, in "Guy's Hospital Reports of 1889," is eleven years. Causes of separation of the epiphysis are a fall from a height, or a glancing blow from above downward upon the shoulder, or disease of the epiphysis.

*Anatomy.*—As previously stated, the epiphysis of the humerus consists of the articular surface of the bone with the two tuberosities; as a result of its separation, owing to the attachment of the capsular ligament to the anatomical neck of the bone, we have the joint involved at its inner aspect. The capsular ligament is attached to the shaft by fibrous expansions at the internal aspect of the head of the bone, and blends with the periosteum throughout the circumference of the shaft. By this blending there is formed a strong resisting fibrous tissue and an agent that limits, to a great degree, the displacements one may find in these cases. When a deformity is marked, it is due to laceration of this tissue, allowing the upper fragment, or the epiphysis, to be displaced forward and downward toward the subcoracoid region, resembling a subcoracoid displacement.

*Signs.*—The arm hangs helplessly to the side; the elbow projects little or none at all; there is a striking and abrupt projection, slightly round, beneath the acromion. In the absence of swelling we can frequently outline the border of this projection as the upper part of the shaft with its bicipital groove, as shown in Case VII. Crepitus, if present, is of a soft, velvety character. The shoulder is broadened from before backward, but the natural roundness may be present; while in case of complete separation of the head and displacement of it, there is a characteristic flattening, and, as a rule, a mass downward and forward, in the region of the coracoid. Shortening is present only in cases of complete separation, and then usually about one inch. Little or no ecchymosis except that due to contusion.

*Differential Diagnosis.*—These cases are liable to be mistaken for dislocations of the subcoracoid or subclavicular variety, but the usual manifestations of dislocation are absent.

Mobility is present, crepitus very frequently is found, and compression symptoms of the brachial plexus are absent.

Fracture of the upper extremity of the shaft of the humerus can be diagnosticated by the age of the patient, false

motion, shortening little or none in fractures, shape of the upper portion of the shaft, ecchymosis usually marked, and grating crepitus.

*Prognosis.*—Union usually occurs early, and is due, according to Mr. Tubby, of England, to the rich vascular supply of the rotator muscles attached to the tuberosities sending to the epiphysis the required nutrition. The upper epiphysis is chiefly instrumental in the growth of the shaft of the humerus, and as a result of its separation the growth of the length of the bone is liable to be materially interfered with. In a number of cases reported by Tubby, in "Guy's Hospital Reports of 1889," shortening of five inches has been noted. The prognosis referring to shortening is modified with the age of the patient; the younger the patient, the greater the danger of considerable shortening; the older the patient, the less the shortening.

Shortening and vicious union also is frequently caused by inability to properly replace the epiphysis.

*Treatment.*—As in fracture of the surgical neck of the humerus. In cases in which it is impossible to reduce the displaced epiphysis, the author would recommend cutting down upon the head of the humerus, using the ordinary guide for an excision, reducing the deformity, then retaining proper apposition by means of sutures through the periosteum of the shaft and the capsule of the joint.

CASE V.—J. D., boy, thirteen years of age, was knocked down in 1891 by a mail wagon and thrown forward upon his right shoulder. He was seen within half an hour after the injury. Swelling was very slight, pain considerable, no deformity; high up false motion could be felt; by grasping the shoulder with the left hand, and moving the arm with the right at the same time, grating of a peculiar soft character was obtained. He was discharged at the end of the third week by his regular family physician. The family report "that you would not know the arm had been broken." Measurements in this case, four years after the injury, reveal a shortening of three quarters of an inch.

CASE VI.—P. B., seventeen years of age, was seen on August 15, 1895, with the following history: While jumping down the stairs

of an elevated railroad station, four days before, he fell forward and down about ten steps, striking on his left shoulder. Upon examination, broadening of the shoulder from before backward, flattening, and a movable body high up in the joint region, soft crepitation, a slight amount of ecchymosis, considerable swelling, and an inch shortening were found. Diagnosis: Epiphyseal separation of the upper extremity of the humerus. He refused anaesthesia and further treatment.

CASE VII.—M. McG., aged sixteen, was seen on the same date as Case VI, with a history of a fall upon his left shoulder, as the result of a push while skylarking some five weeks before. He had been an inmate of one of our large hospitals, and was being treated for a dislocation of the head of the humerus of the subcoracoid variety.

Upon examination, no swelling, but marked flattening, broadening from before backward, and shortening one and one quarter inch, were found. A slightly convex deformity, continuous with the shaft, with the bicipital groove well marked upon it, was found beneath the acromion, and downward and in front, practically subcoracoid, a round, fairly movable mass was felt.

Diagnosis of epiphyseal separation was made and further hospital treatment suggested, it being the intention to cut down upon the joint and reduce the head and retain it by silkworm sutures. Refused further treatment.

I am indebted to Dr. George Stewart for the following case:

CASE VIII.—Girl, fifteen years of age, fell upon the right shoulder about September 1, 1895. On October 10 the condition is as follows: Arm helpless to the side of the body, no tilting of the elbow, one half inch shortening, flattening of the shoulder, apparent broadening from before backward, no swelling, a mass downward and inward from the joint and solid with the shaft immediately beneath the acromion, with internal rotation slightly marked. Diagnosis: Epiphyseal separation with vicious union.

#### ELBOW.

Too great stress cannot be placed upon the proper diagnosis and treatment of fractures occurring at and about the elbow-joint; how frequently ankylosis is seen at varying angles, as a result of these injuries. In some cases there



is a moderate degree of function of the extremity, while others are practically useless. The most frequent injuries occurring at this region are fractures of the condyles of the humerus, epiphyseal separation of the lower extremity, and dislocation of the bones of the forearm.

The cause of these injuries is usually a fall upon the elbow or upon the volar surface of the hand. The symptoms and signs vary with the conditions; if seen shortly after the injury, diagnosis is readily made. Later the swelling is frequently so extensive as to obliterate all landmarks of the bony joint, and an accurate diagnosis can only be made after the swelling has subsided to a great degree, or by the assistance of an anaesthetic.

In cases of epiphyseal separation seen early there is a broadening from before backward, with a sharp, shelving border presenting below and posteriorly, as a rule, and extending across the entire width of the bone. Anteriorly the shaft projects with a sharp border over the backward displaced lower fragment. Motion of the joint is perfect, upon holding the lower fragment between the thumb and forefinger. The head of the radius bears its usual relationship to the external condyle. Crepitus, when elicited, is of a soft, velvety variety, in contradistinction to the grating found in fractures.

*Prognosis.*—No extensive shortening is to be expected, as the length of the humerus depends mainly on the growth from the upper epiphysis.

*Treatment.*—Reduction can be accomplished without much difficulty, then a posterior splint is placed upon the arm and forearm, with the latter almost completely extended.

In these cases, it has been the custom of the writer to remove the dressing in from ten to twelve days, and make slight passive motion, while the lower fragment is grasped and held firmly in contact with the shaft. The splint is removed at the end of the third week; then have the patient carry his arm in a sling for a week, allowing him to exercise the arm gradually.

Fractures of the condyles are due to the same causes as the former, but more frequently due to violence directly received, as in falls, and occasionally a blow upon the condyle. The signs are broadening of the joint, movable body on either side, depending on the condyle broken. Displacement can be made of the forearm to the side of the fracture; the head of the radius is frequently pushed upward in case the external condyle is fractured, impairment of joint motions, and deformity of an oblique variety.

*Treatment.*—Reduction; the use of adhesive strips to hold the condyle in place, and the limb treated in almost complete extension, slight passive motion in ten to fourteen days, then placing the forearm at an angle of  $90^{\circ}$  with the humerus, or continuing the third week with extension.

One factor in treating fractures of the elbow should be emphasised, and that is, never to forget that the forearm should be placed in a position of slight abduction, so as to preserve its carrying properties, and that no upward pressure should be made upon the internal condyle. In fractures of both condyles the treatment has been the same as in cases of fracture of a single condyle, with the exception of the retaining strip of adhesive plaster.

#### FRACTURE OF THE EPICONDYLE.

Of this injury the writer presents the clinical history of but one case. The violence is direct, and, upon examination, a small foreign body is found, usually forward, and downward below the elbow-joint. In the case cited, the internal epicondyle was pulled upward.

*Treatment.*—Reduction, if necessary, by flexing the elbow; retain the fragment by an adhesive strip and bandage over all. Remove the dressing on the fourteenth to twentieth day.

*Differential Diagnosis.*—Fractures of the lower extremity of the humerus are to be diagnosticated from dislocation backward of both bones.

The signs and symptoms of fracture in a recent case are

so evident that this error should not be made, but in a case of epiphyseal separation it is more likely to occur.

In dislocation there is immobility of the joint, the head of the radius is pushed backward, or backward and upward, the olecranon protrudes posteriorly as a rounded or conical mass, while anteriorly there is a depression over the site of the elbow. These signs, when compared to the signs of epiphyseal separation as given, should enable one to arrive at a proper diagnosis.

CASE IX.—D., boy, aged ten, fell from a tree during the summer of 1892. Came to me through the kindness of Dr. E. T. T. Marsh during the fall of the same year. Upon examination, a ridge fully one quarter inch wide and flat was found protruding backward and continuous with the lower end of the humerus, while anteriorly there was a ridge protruding forward and continuous with the shaft of the same bone. Extension was perfect. Efforts at flexion were checked with a dull sound, as if some object were being struck by the coronoid of the ulna, as the forearm came to about 90°. The elbow was not widened nor deformed, as is usual in cases of fracture.

Diagnosis: Old epiphyseal separation. Operative interference was advised, but not accepted. The boy's father stated recently that the condition was still the same.

CASE X.—M. D., two and one half years of age, came under observation on May 12, 1894, with the history of a fall from a chair, striking on her left elbow. The ordinary signs of epiphyseal separation were present.

Treatment: The deformity was readily reduced and easily retained. The forearm was then placed in a condition of almost complete extension and bandaged to a posterior splint, extending from the upper third of the arm down to the wrist-joint. The splint was removed in twenty days and the limb bandaged for a week. Result excellent.

In connection with Cases VIII and IX the writer refers you to the history of Case XV for another epiphyseal separation at the elbow-joint.

CASE XI.—M. O., five years of age, fell down two steps August 2, 1894, striking upon her left elbow. She was seen on August 4,

with a straight splint upon the dorsal aspect of the arm and forearm. Upon examination, false motion, and deformity over the internal condyle and grating crepitus were found.

In this case there was also considerable swelling and ecchymosis. The deformity was reduced. A small strip of adhesive plaster was wound around the inner aspect of the forearm to retain the fractured condyle, the forearm was then abducted slightly and extended, and a posterior splint applied. She was discharged, with a good result, on September 2, 1894.

CASE XII.—A. K., five years of age, in June, 1893, fell four stories, striking the roof of an extension, then bounded off, falling to the ground. The case was seen immediately by Dr. DeGarmo, who very kindly referred it to the writer.

The boy was seen about an hour after the injury; upon examination, false motion at the site of the external condyle, deformity, some swelling, ecchymosis, and crepitus were found, with general contusion of the trunk; otherwise he was in excellent condition. The limb was put in extension under chloroform anaesthesia and kept extended for three weeks, at the end of which time the splint was removed permanently. A week later the result was excellent, and owing to the boy's activity, he had regained complete function of his joint about the fifth week.

CASE XIII.—C. O., five years of age, fell down stairs about four steps on March 17, 1895, striking his right elbow. He was treated four weeks at two hospitals, previous to coming to St. Vincent's Hospital Dispensary. He was seen on April 19, 1895, one month after the injury, at which time the following conditions were found: forearm flexed at right angle, the external condyle displaced outward and downward, a cutaneous slough, the result of pressure, about the size of a ten cent piece, over the tip of the condyle, joint ankylosed, and atrophy of the muscles of the arm and forearm. Under chloroform anaesthesia, the ankylosis was broken up, and the fractured and displaced condyle was reduced, and the limb treated in extension for three weeks. At the end of this time, there was no union of the fragments. For four weeks the boy remained under observation without union taking place, and was then sent into the hospital to keep him off the streets. He was discharged in two weeks, with union and a fair result.

CASE XIV.—E. M., aged seven, referred to the writer by Dr. Joseph Collins, three years ago, fell from an iron fence, striking

upon his left elbow. He was seen, four days after the injury, with an enormously swollen arm and forearm.

Evaporating lotions were applied for almost a week, with the forearm extended. Then ether was given, and a diagnosis of fracture of the external condyle was made; the usual treatment by extension was carried out for about a week, when the limb was encased in plaster, with the forearm flexed. The plaster was removed in two weeks. Within six weeks the boy had almost complete flexion and extension. Recent reports in this case are entirely satisfactory.

CASE XV.—Boy, seven years of age, was struck upon the inner side of his left elbow. Examination revealed a hard mass, about the size of a large pea, upward and backward from the internal condyle. No ecchymosis or swelling. Some pain at the elbow.

Diagnosis: Fracture of the epicondyle. Treated by adhesive straps and pad for fifteen days. Result good.

#### RADIUS AND ULNA.

There is but one case of interest to report, that involves the bones of the forearm. This was an epiphyseal separation, occurring in both bones at the wrist, and a separation of the lower epiphysis of the humerus. The injury was received by falling down a flight of stairs, fourteen or fifteen in number.

As the main growth of the forearm depends upon the lower epiphysis, the importance, with a view to prognosis, in cases of epiphyseal separation at this extremity, can readily be estimated. This injury is due to direct violence or hyperextension of the hand. The signs of this injury are a marked transverse deformity just above the wrist posteriorly, as compared to the oblique deformity in Colles's fracture; an anterior prominence due to the lower ends of the shafts of the radius and ulna, also of a transverse variety, and abnormal mobility above the wrist.

*Treatment.*—A dorsal splint after reduction, extending to the fingers, and retained for about three weeks.

Cases of epiphyseal separation of both bones are extremely rare, as compared to those of the radius or ulna alone. Dolbeau reports a multiple case, in which both radius and ulna



on the one side and the radius on the opposite side, suffered separations.

Owing to the fact that the main growth of the forearm depends upon the lower epiphysis, prognosis with a view to shortening is bad; in single separations, lateral deformity is usual. Numbers of cases of separation of the lower epiphysis in either bone have been reported, and a large proportion were followed as a result of the diminished growth of the injured bone by marked lateral curvature, the normal bone during its growth curving toward the injured side. In these cases it is advised to excise a length of the uninjured bone sufficient to overcome the deformity.

CASE XVI.—M. D., girl, four years of age, on May 17, 1894, fell down stairs, and was brought to St. Vincent's Hospital Dispensary for treatment. She complained of pain in the wrist and elbow of her right side. Upon examining the wrist, a peculiar transverse deformity, sharply outlined, presenting upon the posterior aspect of the forearm about a half inch above the wrist-joint, was observed, while anteriorly there was a deformity continuous with the shafts of the bones of the forearm. At the site of the deformity, during manipulation, a soft crepitation was apparent. At the elbow there were the characteristic evidences of an epiphyseal separation of the lower end of the humerus.

Diagnosis: Epiphyseal separation of the lower end of the radius and ulna, and also at the lower end of the humerus. The separations were reduced, and the limb was then placed upon a long posterior splint, extending down to the metacarpo-phalangeal articulations. She was discharged in four weeks, with a good result.

In conclusion, the author desires to express his indebtedness to Drs. Joseph D. Bryant and Carl Beck for their kind permission to use such of their hospital material as might be of service to him.

## THE QUESTION OF ADMINISTERING DIGESTIVE FERMENTS.

By H. A. HAUBOLD, M. D., of New York County.

*Read by title October 17, 1895.*

So much has been said on the affirmative side and so little on the negative side of the question of administering digestive ferments to dyspeptics and other invalids, that I am induced to place before the reader a statement of facts pertaining to this subject the importance of which to the people, to the physiologist, to the chemist, and to the physician, can scarcely be over-estimated.

Cells derive the elements of their secretions from the blood. The active principles contained in secretions do not pre-exist in the nutritive fluid: they are found in the cells of the secreting organs. The ability of a cell to convert constituents of the blood into peculiar substances called ferments or enzymes is called its function. This process is not clearly understood, still physiologists have studied and learned some of the laws that govern this phenomenon in the digestive organs.

Digestion is an intermittent process. It goes on slowly and gradually and extends over several hours. The elements necessary to the production of those changes in articles of diet, essential to their absorption, are secreted gradually and as they are needed. When sufficient of one element has been secreted to produce change enough in the food to make it ready for the next change the element necessary to this is brought in contact with the ingesta.

Absorption begins practically simultaneously with the first steps of digestion, certainly as far as certain classes of ingesta are concerned, viz., the uncombined organic nitrogenised and the inorganics.

Digestive secretions form combinations or mixtures with the portion of food they have acted upon and are reabsorbed.

This is readily understood if it be remembered that the amount of gastric juice required to produce the necessary digestive changes in a single meal is large enough to produce circulatory disturbances were the blood deprived of so large a quantity of substance at once.

Pepsin does not exist as such in the cells of the stomach. It is secreted as pepsinogen and is converted into pepsin by its contact with the hydrochloric acid which is secreted by the so-called acid cells. Pepsin is not stored up in the walls of the stomach, but is formed as it is needed and exists, really, only just as the gastric juice is thrown out into the cavity of the stomach.

It is constantly being produced during the three to three and a half hours of gastric digestion, and is constantly being reabsorbed together with the portion of food it has acted upon. The elements of diet absorbed by the stomach are relatively small in quantity as compared to those taken up by the small intestines. Stomach digestion is largely preparatory. Even the class of food known as the organic nitrogenous or albuminoids is to a considerable extent digested in the less intestine. It is well known by chemists that a peptone may be produced by the prolonged use of pepsin digestion, but much quicker results are obtained by the use of trypsin. Still the stomach is greatly concerned in isolating the various constituents and rendering them more prone to the action of the other digestive fluids. The pharmaceutical preparation known as pepsin is an agent that is isolated from the cells of the mucous membrane of the stomach.

This pre-supposes that a stomach taken from an animal contains in its walls a ferment that has been created from the constituents of the blood, and is stored up in this situation, waiting to be secreted. Had the organ not been used for pharmaceutical purposes the ferment would have been pro-

pelled into the cavity and taken part in digestion. As it is, the pepsin is caught in transit, that is, between the time of formation and secretion.

After isolation it is powdered or made into tablets or otherwise prepared for dispensing, either alone or in various forms and combinations. Now if a certain portion of this preparation be introduced into the stomach when it is in full digestion, it is expected to convert the organic nitrogenised elements present at the time into peptones, thereby taking the place of the normal ferment.

There is reason to doubt that this phenomenon takes place. First of all, it is not probable that the preparation is the same substance as the normal pepsin contained in gastric juice, that is, if the physiology of the creation of this digestive fluid is understood, and pepsin is not stored up in the cells of the stomach.

If we are to believe that the office of the stomach is to take up organic nitrogenised elements, the commercial pepsin is indeed in a condition to be absorbed at once and with greater rapidity than any portion of the food itself. It is not probable that the stomach remains indolent as an absorbing organ long enough for an artificial ferment to be very efficacious in its action on albuminoids.

An artificial ferment to be of service as such, and by itself, should, upon its introduction into the digestive system, be capable of producing those changes in ordinary articles of diet that usually take place there. In illustration, it should be capable of attacking a piece of macerated lean meat, either wait for the sarcolemma to be dissolved or aid in its solution, and then convert the liberated muscular tissue into peptones. It is probable that the artificial ferment has entered the general blood supply long before these changes take place. Quoting from a recently published work on physiological chemistry,—“It is almost impossible to obtain a pure pepsin. The rapidity of digestion depends upon the quantity of pepsin present, unless the pepsin is contaminated with products of digestion. The accumulation of products of

digestion disturbs digestion." This shows that it is necessary that the ferment be reabsorbed as it has acted, and that new pepsin must be constantly secreted to continue gastric digestion. It is no doubt true that elements are separated from the glands of the stomach capable of rendering certain articles of diet more readily assimilable. Of course it is difficult to say how much of this is due to the care and detail observed in the preparation of the articles themselves, and how much is due to the fact that the conditions of making tests are practically never obtained in the stomach. After all, pepsin acts on one class of constituents of diet only, *i. e.*, the organic nitrogenised, and then only after prolonged labour on the part of the stomach.

The artificial ferment certainly is not intended to convert starch into glucose or sugar into glucose, nor is it of service in the emulsification of fats and oils. These constituents are acted upon in the small intestine, and indeed even the albuminoids are very largely acted upon in this situation. These later facts are perhaps the most important objections to the use of artificial pepsin. The gastric juice has an important office to perform in the digestion of vegetables. Vegetable albuminoids (such as gluten) are to some extent converted into peptones in the stomach, but their separation from the carbo-hydrates and hydro-carbons occupies considerable time.

The pepsin administered with the view of influencing these elements would have to be endured with some patience and much foresight to attack them just at the proper moment. No doubt most of the vegetable albuminoids are acted upon in the small intestine when the changes in the carbo-hydrates and hydro-carbons are very active. Pepsin certainly never arrives here, and would be of no service if it did, acting as it does only in an acid medium.

To recapitulate: It is first of all a question if the commercial pepsin is in any way allied to the ferment contained in normal gastric juice, and if it is retained in contact with the food long enough to be of service if it were. It could at best



act only on a very small portion of ingesta, and plays a very unimportant part in the most important functions of gastric digestion, namely, the separation of the various constituents. It seems to me that the administration of pepsin is from a physiological standpoint absurd.

A substance has been isolated from the pancreas and given the name of pancreatin. There is no such thing in physiology as pancreatin. It is true that a fresh extract of pancreas will convert hydrated starch into glucose, but the pancreas must be removed while the animal is in full digestion.

In the experiments made for class demonstration at Bellevue college, it has been found that the conversion of starch into glucose does not take place if the pancreas be taken from an animal during the intervals of intestinal digestion. Also that the capability of converting starch into sugar, of an entire pancreas, is very small when compared to the total amount of carbo-hydrates usually introduced at an ordinary meal. This would prove that the pancreas is not a store-house for the ferments of the pancreatic juice, but these ferments are formed from the elements of the blood as they are needed, and are practically immediately secreted into the small intestine.

The substance called pancreatin could act only in an alkaline medium at best. No doubt it is absorbed in the stomach, together with other organic nitrogenised constituents, being in a condition that renders its absorption by blood vessels an easy matter.

Intestinal digestion as applied to the time occupied in the digestion of a single meal does not occupy a certain definite portion of the whole space of time required to entirely digest all the ingesta. It begins shortly after food is introduced into the stomach. A small portion of ingesta is liquefied, and this is projected into the duodenum and there comes in contact with the pancreatic and other intestinal juices. If by means of pharmaceutical art, the preparation known as pancreatin were not acted upon by the gastric juice, and entered the small intestine unchanged, it would be cause for wonder-

ment at what portion of the process just described it would arrive at its goal.

It is fair to believe that when a portion of food is propelled into the duodenum some of the pancreatic juice comes in contact with it at once, and that this secretion is absorbed, together with the portion of food it has acted upon.

Again, in this situation, it is absurd to believe that the absorbing organs of the intestine wait for the pancreatin to arrive in the company of a certain portion of more or less macerated food and then wait still longer for the artificial ferment to perform its function on what is to arrive later. It is far more probable that the pancreatin, if it ever reached the small intestine, would be absorbed far more readily than the food itself. Not the least important action of the pancreatic juice is that of emulsifying fats. Steapsine, the ferment concerned in this action, does not emulsify fats of itself. It acidifies them, and the emulsification is the result of the mechanical action of the viscosity of this secretion. Commercial pancreatin certainly plays no part in this phenomenon.

Regarding the action of this agent on organic nitrogenised elements and carbo-hydrates, the same objections hold good here that apply to gastric digestion. Indeed, although the pancreas is perhaps the most important of the organs concerned in intestinal digestion, the intestinal glands and the liver are also endowed with very important functions. It is hardly necessary to go into these to any extent for the disturbances that follow obstruction to the flow of bile are well known.

The preparation known as pancreatin is surely not expected to supplement this secretion. Recently a preparation has come upon the market reputed to be a mixture of the ferments of all the digestive secretions, including one element isolated from the spleen. This latter agent it is claimed is very potent in the emulsifying of fats. The absurdity of this kind of therapeutics is quite apparent when it is considered how all the animal secretions act only in their particular regions in which they are secreted. Saliva, it is true, acts to

a slight extent on the starches in the stomach, but it is not important.

If an artificial pancreatic fistula be made, and the duct connected with a canula, it will be seen that this organ secretes its juice very slowly, and that the quantity secreted for the digestion of a single meal must be very large. It is difficult to conceive that this process is in any way aided or imitated by the administration of from five to ten grains of so-called pancreatin. Indeed, it is no doubt safe to say that none of the commercial digestive ferments are of any service whatever in giving rise to those changes in the ingesta that are essential to their absorption.

# RETENTION OF URINE DURING URETHRITIS, AND FROM URETHRAL STRICTURE.

By J. W. S. GOULEY, M. D., New York County.

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## I.

### RETENTION OF URINE DURING URETHRITIS.

Retention of urine during acute and chronic urethritis is of sufficiently frequent occurrence to merit such notation as may be likely to remove the erroneous impression, long prevalent among physicians, respecting the kinds of urinary retention commonly ascribed to swelling and to spasm, and inaccurately specialised as "acute inflammatory stricture, and spasmodic stricture" of the urethra. These designations began to be employed before the advent of methods of precision in urethral exploration, and may now be regarded as relics of archaic pathological literature preserved by ardent votaries.

The condition specified by many old writers as "acute inflammatory stricture" does not exist in the perinaeal and anterior, but is discernible in the posterior, segments of the urethra as far as the vesico-urethral orifice, and cannot, in any sense whatsoever, be regarded as a stricture. This morbid state is a common cause of retention of urine, from acute urethritis, even in patients whose urethrae were never before diseased, and is in reality the occurrence of oedema of the urethral mucous membrane, in its posterior regions, sufficient to close the passage just as oedema of the glottis closes the larynx. When urethral oedema occurs soon after the backward extension of the inflammatory process, it is generally excited by undue exposure to the elements, during a debauch

in wine, on or about the third week of a neglected urethritis, and sometimes sooner. There being, in these cases, a certain degree of trachelo-cystitis, urination is, at first, frequent and painful. The swelling then rapidly augmenting and, in the course of a few hours, closing the vesico-urethral outlet, there ensues complete retention of urine, attended with very great pain, due to the fast-increasing vesical distension.

The fact that a patient having retention of urine is also affected with acute urethritis and has been indulging immoderately his appetite for alcoholic beverages, is sufficient to make the physician aware of the nature of his ailment and to suggest the kind of treatment needed for the speedy relief of the bladder, since, if it be allowed to become greatly over-distended, the consequences may be of the gravest.

Formerly cases of the sort just described were treated locally, by the application of leeches to the perinaeum, followed by warm poultices, and constitutionally, by the administration of large doses of tincture of the chloride of iron. When, in about forty-eight hours, a little urine began to escape—involuntarily, from over-flow—it was supposed that the “heroic treatment,” without resort to the catheter, had been successful, and there was little thought of the injury likely to be done to the upper urinary organs by the extreme vesicle distension; and when, thirty-five years ago, a physician ventured at once to introduce the catheter in such a case of retention of urine—to the rejection of the regulation antiphlogistic treatment—his practise was regarded as heretical, rash, and highly censurable. But after repeated successes of the rash physician’s heretical method, there came a gradual change in the management of the distended bladder, and the catheter began to be used as the first recourse of the medical man to meet the prime indication of emptying the gorged viscus. Suitable means were then used to reduce the vesico-urethral swelling—the real impediment to spontaneous urination.

Ever since the innovation just mentioned, this method of treatment has been employed with great success by those who rightly appreciate the true pathogeny of the variety of



retention of urine in question, with the difference that, while previously a metallic catheter was brought into requisition, now, physicians use a curved, soft-web catheter, without stylet, not larger than No. 9 of the English scale. The metallic instruments were liable to do serious mischief, and almost always caused haemorrhage. The soft, pliable silk-web catheters are introduced with ease, and are absolutely safe when rendered aseptic. The introduction of the catheter may not be required more than once when the retention of urine is not over twelve hours' standing, but when the bladder has become greatly over-distended and can not empty itself spontaneously after a few days of regular catheterism, the insertion of the catheter every six hours becomes necessary for several weeks, and sometimes for a much longer period.

The bladder having been emptied—provided the distension had been moderate, otherwise only half of its contents should be allowed to escape, for well-known reasons—the local treatment is begun, and consists in the use of rectal suppositories of ice, as suggested by Cazenave. These suppositories are made of pieces of ice, one inch by one inch and a half in size, suitably smoothed, and eight or ten are introduced in rapid succession so as to pack the lower end of the rectum. After the lapse of two or three minutes, the ice having melted, the water is allowed to escape, and more of the ice lumps are introduced. This process is continued for about two hours, and repeated in two hours. It is rare that more than three such repetitions become necessary. Afterward a suppository of a quarter of a grain of belladonna extract and two grains of opium is inserted. Rest in bed is of course enjoined.

The general treatment consists in the administration of alkaline beverages for two or three days; then the tincture of the chloride of iron may be given in doses not exceeding five minims, three times daily.

The after-treatment should consist of antiseptic irrigations and moderate dilatation of the posterior urethra until all vestiges of the inflammatory process have disappeared.

The so-called "spasmodic stricture" has often been the

refuge of clumsy catheterists who, failing to reach the bladder, almost invariably assign this failure to the presence of a "spasmodic stricture"—an imaginary obstruction conceived in the mind of the reckless operator whose wandering hand misguides the instrument, much to the injury of a permeable urethra. No just claim can be made for the existence of such a morbid entity as a purely spasmodic urethral stricture, since no proof has ever been given of the occurrence of spasm of the muscular tissue in a limited area of the perineal or of the anterior portion of the urethra, sufficient to bind, narrow, or close the canal long enough to prevent the passage of the urine, and cause distension of the bladder after the manner of veritable strictures, coarctations, stenoses, all of which terms being used by physicians to denote permanent narrowing. It is well known that true urethral strictures are very generally attended with spasm of the ambient muscle tissue, and that this spasm sometimes extends to the membranous region and to the vesico-urethral orifice, particularly during catheterism; but the spasmodic action is ordinarily transitory, lasting only a few moments. Mercier, whose widely published inquiries into the pathogeny and therapy of affections of the urinary organs, including the most extended and exhaustive study of urethral spasm, never regarded this spasm as a stricture in any sense, and this view has been confirmed by many other observers. He was, perhaps, the first physician to call attention to the ill effects of neglected urethro-vesical spasm due to chronic urethritis.

While the urinary retention caused by oedema of the urethral mucous membrane, during acute urethritis, is an acute, complete retention, its onset being sudden, the vesical distension rapid, and the attending pain almost insupportable; that which is the consequence of urethro-vesical spasm, due to chronic urethritis, is a chronic, incomplete retention of urine, its progress being very gradual, slow, and insidious, many months elapsing before the patient is aware of the existing mischief. In some cases, this kind of retention of urine never becomes complete. Spasms of the posterior ure-

thra can give rise to incomplete retention of urine only when they involve the vesico-urethral fibres, and are tonic spasms, while clonic spasms close the vesical outlet so transitorily as to render possible not only urination, but thorough evacuation of the bladder. After long-continued spasms comes permanent contracture of the vesical neck, with its consequent retention of urine.

Those who are affected with chronic urethritis and trachelocystitis are nearly all dyspeptic and lithuric; the spasms of the posterior urethra being more violent and painful during urination, and being excited by the acrid urine which contains an abundance of uric acid or of calcium oxalate crystals, whose sharp corners greatly irritate the diseased mucous membrane. Generally, patients give little attention to the painful and frequent urination into whose cause they make no inquiry, and seldom take advice until the spasms have become tonic, or even until permanent contracture of the vesical neck is established to produce complete retention and decomposition of the stagnant urine, general cystitis, thickening of the bladder coats and, perhaps, serious morbid changes in the ureters and kidneys.

The diagnosis of retention of urine due to spasm of the vesico-urethral muscular fibres is not difficult; still, in some cases of chronic urethritis, both the clonic and tonic spasms often simulate the presence of stone to such a degree that the physician almost invariably searches the bladder carefully before excluding calculus as a factor in the morbid condition. During this search, the urine may be allowed to escape through the instrument used for the purpose. If this urine be apparently normal, or contain only a little pus, the presumption is that its stagnation has not been of very long standing, otherwise it may be inferred that general cystitis is fully established.

A typical example may serve to illustrate an occurrence which is not uncommon in the practise of physicians of long experience. A patient, making vague complaints of some discomfort in the hypogastrium, but unconscious of having

retention of urine or, rather, believing his bladder to be sound, for he had just urinated, is astonished when he sees ten or twelve ounces of urine flow through a catheter introduced by his physician. On the next day, however, he calls, not to express gratitude, but to denounce peevishly the catheter and the physician, for, as he says, spontaneous urination has not been possible since the passage of the catheter which, he fears, has done him lasting injury. An interpretation of this phenomenon, and at the same time an answer to the anxious patient's queries, may be made as follows: The bladder, having long been in a state of distension, is not able to expel its contents when it fills up, after the first artificial evacuation, by reason of contracture of all its fibres, which are more or less matted by plastic exudation resulting from chronic cystitis. In the great majority of such cases, complete retention of urine may be expected to follow the first and many succeeding artificial evacuations; therefore, the physician is fully justified in insisting that the patient shall depend for urination entirely upon the catheter, which does no injury whatsoever in careful hands, but which serves so well to unburden the dangerously distended bladder. The little inconvenience, the short time taken to keep the catheter aseptic, and the very slight pain caused by its introduction, are surely not to be measured with the ill-consequences, nay, the immediate danger, of retention of urine. To prevent invidious remonstrances on the part of the patient, the physician should, at the first consultation, give him a full explanation of the condition of his bladder, and impress upon him the likelihood of complete retention of urine, necessitating the regular use of the catheter until, if possible, the bladder is restored to its normal state, and if not, that the catheter will have to be used for an indefinite period, or a surgical operation may become necessary.

Beside recourse to the catheter to relieve the bladder of stagnant urine, and the local management of the existing cystitis, the treatment of spasm of the vesico-urethral outlet should be directed to the chronic urethritis and to the hyper-

lithuric state of the patient, which is the excitant of the spasms. The fulfillment of these indications, during the early period of the complaint, ensures a permanent cure. But when the contracture of the urethro-vesical fibres is fully established, it is necessary to dilate, divulse, or even sometimes to incise freely the neck of the bladder by an internal or by an external operation. In any of these circumstances, the after-treatment should consist in periodical stretchings of the vesical neck with suitable instruments until the parts heal, and perhaps for several weeks subsequently.

Much more remains to be said on this subject, but it was thought sufficient to sketch only the essential points in the nature, diagnosis, and management of the two kinds of urinary retention described, and to show that the notion of acute inflammatory and spasmodic strictures is misleading, irrational, and contrary to the present knowledge of morbid processes.

## II.

### RETENTION OF URINE FROM URETHRAL STRICTURE.

The purpose of these notes is to recall attention to some of the ready and simple methods of relieving sufferers from the distress caused by retention of urine, due to urethral stricture. This kind of urinary retention is seldom sudden; it is ordinarily preceded by difficult urination, whose increase—from month to month, from week to week, from day to day—is proportionate to the diminution of the urethral calibre at the diseased point, and also to the degree of muscular spasm of that part of the canal. For several weeks prior to complete retention, although urination be very frequent, the bladder is not emptied; this constitutes incomplete retention of urine, which, from its stagnant state, soon gives rise to cystitis. At length the urine ceases to flow; there is then complete retention. This urine, accumulating for thirty-six or forty-eight hours, begins to slobber involuntarily, when the complete relapses into incomplete retention.

The laity often regard involuntary escape of urine as cause



rather than effect, an endeavour to repress the "undue flow" by sundry processes, which, fortunately, prove ineffectual. Meanwhile the vesical distension increases, and unless the patient invoke a physician's assistance without further delay, the urethra is likely to burst behind the stricture and give issue to the urine, which infiltrates and destroys the connective tissue of the perinaeum and scrotum. In rarer instances of inordinate vesical distension, a fall, a sudden movement of the body, or a violent struggle during anaesthesia, has been known to cause rupture of the bladder.

Long-standing incomplete retention of urine with spasm of the bladder is much more serious than the retention which becomes complete in the course of a few weeks, for, in the first-named condition, the upper urinary organs are often irreparably damaged and the prognosis is generally unfavourable. It is before the advent of these untoward effects that the greatest good is to be accomplished. Therefore, experienced physicians recommend the early treatment of stricture as preventive of retention of urine and its ill-consequences; but their instructions are seldom followed, and the responsibility rests with all unruly patients who are too apt to seek advice at the last moment, when the bladder is distended to its utmost degree and the suffering is more than can be longer endured, even by the most stolid of men, after divers nostrums have been tried and found wanting in efficacy.

It is too common in such cases to resort to cutting operations, which are indicated only after failure of careful catheterism with filiform bougies, or after repeated supra-pubic capillary puncture of the bladder and aspiration of the urine. In ordinary cases it is possible to give prompt relief by making some preliminary dilatation of the stricture; beginning with a No. 1 soft, olive-pointed bougie, and continuing the dilating process by passing successively Nos. 2, 4, 6, and 8, after which it will be easy to use a No. 7 curved web-catheter that serves to allow the urine to flow slowly until about two thirds of the amount contained in the bladder shall have escaped. The catheter is then plugged at its free extremity,

is fastened in position, but is not retained more than thirty-six hours, during which time some urine is drawn off every three hours, and the bladder finally emptied a few moments before the instrument is withdrawn. After this the stricture is gradually dilated by using bougies of increasing size every third or fourth day until the normal calibre and the suppleness of the urethra are restored. Without preliminary dilatation by means of small bougies, it is usually difficult and often impossible to introduce a necessarily small web-catheter by reason of its undue flexibility as soon as it is warmed in the urethra. The insertion of a metallic stylet in a small web-catheter is not prudent on account of the possibility to perforate the instrument and the urethra, even when the manipulations are carefully and gently conducted.

Any stricture amenable to the method of treatment above described may be regarded as an easy case. The physician is, however, liable to be called to minister to cases that are not manageable with regulation bougies. Like cases have been related with the paradoxical title,—“The way to pass impassable strictures,” or “How to pass a bougie when it cannot be passed.” These surgical bulls have come forth from time to time during the past three decades. The meaning sought to be conveyed seems to be, in the first case,—how to pass strictures that are impassable by ordinary instruments; and in the second case,—the kind of bougie to use when the common sort fails. These ideas could have been more briefly expressed by, catheterism in difficult cases.

The difficult cases are those of very narrow, eccentric, tortuous, dense, and resilient strictures, which are accompanied by inordinate spasm of the muscular layers and are seated in the perinaeal region of the urethra. A second narrowing in the penile region is generally a troublesome complication which often necessitates internal urethrotomy.

A debauch, in wine or venery, is commonly the excitant of complete retention of urine. In such a case the urethral mucous membrane is likely to be swollen and sensitive, and to bleed freely as soon as a bougie is passed. As a general

rule, when catheterism is not deemed expedient, the bladder is punctured above the pubes with a hollow needle, through which the urine is aspirated, and, if necessary, the operation is repeated until suitable instruments can be used to treat the stricture.

One of the simple and ready methods of entering a narrow stricture, whose lumen is eccentric, is by means of a filiform, probe-pointed, whalebone bougie, elbowed at its extremity. This instrument is used as an explorer of the narrowed canal and is quickly passed through the stricture in nine out of ten difficult cases, and serves as a conductor for a No. 1 or a No. 2 conical, curved, steel staff, grooved along its convexity, and having a canal or tunnel two or three millimeters in length, beginning at the blunt point of the instrument and ending in its groove. Through this canal is threaded the bougie, which guides the staff into the stricture, dilating it sufficiently to permit the introduction of a larger tunneled sound, then a third, fourth, fifth, and so on, until divulsion occurs. After this a tunneled catheter is substituted and enough urine is drawn off to relieve the distress caused by distension. The bladder is not completely emptied until the second day. The object of delaying to empty the bladder is to guard against vesical hæmorrhage, which is so likely to occur after the sudden withdrawal of all the urine in cases of long-standing distension of the viscus, particularly in elderly men.

It sometimes happens that a stricture is so dense that it cannot be dilated by the tunneled sound beyond No. 2 or No. 3. In that case a tunneled catheter No. 2 or No. 3 is substituted, and through this instrument the urine may be aspirated if necessary. Then a small web-catheter is passed and fastened in position for forty-eight hours, during which time the urine is allowed to trickle out, partly through and partly beside the instrument. On the third day it is generally possible to carry on dilatation with less difficulty, and, if needed, the process of continuous dilatation may be repeated until the stricture shall admit a bougie of the size of the normal

calibre of the urethra. When, however, a stricture seated in the perinaeal region cannot be entered with any kind of bougies, after repeated trials, it is proper to resort to its external division, with the double object of curing it and of relieving the distended bladder.

For some years past there has been a pernicious fashion of dilating the strictured urethra to an excessive extent, and of using the dilators with undue frequency. In the many cases so treated the consequence has been a total loss of the urethral suppleness due to sub-acute urethritis, with extensive infiltration of round cells and their subsequent transformation into scar tissue, so that the canal, although greatly increased in calibre, is in a state of permanent contracture.

Men of dissolute habits, like the cases presently to be stated, seldom return for radical treatment until they are again suffering from retention of urine. Narrow resilient strictures are not permanently cured by any method of treatment whatsoever, unless the treatment be followed by the persistent use of dilating instruments, once every week or ten days, for at least three years. Some patients need the use of such instruments for many years, if not for life.

The following recent cases may serve to illustrate the efficiency of tunneled sounds and catheters in difficult cases of urethral strictures with complete retention of urine :

W. L. S., twenty-eight years of age, was admitted to Bellevue Hospital on the 8th of April, 1895, suffering much pain from retention of urine, which had become complete thirty-six hours before. He had had three attacks of urethritis, the first, twelve years, the second, three years, and third, eight months before admission to the hospital. The first attack lasted three months, the second, four months, and the third merged into a gleet, which existed at the time of his final retention of urine. During the eight months prior to admission, he had repeatedly had complete retention of urine after great abuse of ardent spirits, but was each time spontaneously relieved, except after the last debauch, which began early in April, 1895, when, on the morning of the 7th of that month, the retention persisted, but he did not apply for medical aid until the following morning, and the physician employed undue

force in using the catheter, with the only result of drawing blood instead of urine. With his bladder distended to the level of the umbilicus, the patient was conveyed to the hospital on the afternoon of the 8th of April.

Exploration of the urethra revealed a narrow stricture in the region of the bulb, and a false passage anterior to the stricture. The urethra having been filled with oil, an elbowed, filiform whalebone bougie was passed through the stricture and, reaching the bladder, was used as a conductor for Nos. 4, 6, and 8 conical tunneled sounds, with which the canal was rapidly dilated, when tunneled catheters Nos. 7 and 10 were introduced, and eighteen ounces of urine drawn. The patient was then sent to bed after he had taken ten grains of quinine. No anaesthetic agent had been administered. Three quarters of an hour afterward he passed spontaneously five ounces of urine without, however, emptying his bladder. In two days the stricture was dilated to No. 12 (English gauge); on the fourth day, to No. 13; and on the eighth day to No. 14, which has since been introduced every fourth day. The patient has experienced no untoward effect, and has been able to urinate at ordinary intervals, in a large stream, and to empty his bladder. It is scarcely necessary to say that antiseptic precautions were taken in the treatment of this, as well as in the many other cases of urethral strictures received in the hospital.

E. T., fifty years of age, was admitted to Bellevue Hospital, on April 22, 1895, in a profound state of alcoholic intoxication, suffering from complete retention of urine of forty-eight hours' standing. His bladder was distended beyond the umbilicus, although urine had been slobbering out for twelve hours. He was an habitual excessive drinker, and his final debauch had lasted three days. He had had three attacks of urethritis in the course of fifteen years, and had suffered retention of urine three times during the twelve months prior to his admission. Once the bladder was relieved of its burden of urine by suprapubic capillary puncture and aspiration. There were two dense, narrow strictures, one in the penile, one in the perinaeal, region of the urethra. Very soon after admission, he was successfully catheterised with a filiform whalebone bougie and tunneled instruments, beginning with No. 2 and carrying the dilatation to No. 6, when twenty-eight ounces of clear urine flowed through the catheter; this being about two thirds of his bladder contents. An olivary bougie, No. 5, was then passed and retained in position twenty-four hours; the urine



oozing beside the bougie after a few hours. The usual dose of ten grains of quinine was administered. Dilatation of the strictures was continued every second day, and at the fourth and fifth sittings No. 8 was easily introduced. In the meantime the patient urinated in a good stream at regular intervals. Dilating instruments were used every fourth day until No. 13 could be easily passed. The patient was advised to continue this treatment indefinitely, and was discharged, at his own request, on the 27th of May.

The writer has employed this method of treatment, in upward of five hundred difficult cases of urethral stricture, with a degree of success that warrants an earnest recommendation of its more general use. In the great majority of these cases no anaesthetic agent was administered, because the operation is not very painful, because it is of short duration, because of the danger of vesical rupture incurred during the struggles of the semi-conscious patient in the second stage of anaesthesia, and because of the ill-effects of some anaesthetics—particularly ether—upon the kidneys. The mortality has not exceeded three per centum, and has been due mainly to advanced disease of the bladder, ureters, and kidneys.

## A CONTRIBUTION TO THE THERAPEUTICS OF DIABETES.

By J. BLAKE WHITE, M. D., of New York County.

October 17, 1895.

While the constitutional conditions on which depend the three usually recognised diatheses—the lithic, oxalic, and phosphatic—have been somewhat determined, that of the diabetic has never yet been clearly defined.

The lithic occurs in persons of florid appearance and robust habit—*bon vivants*—who suffer from irritable gastric dyspepsias, and is also associated with a gouty or rheumatic tendency, or with some form of chronic skin disease, especially psoriasis.

The oxalic is characterised by the formation of oxalate of lime in the urine, and appears in individuals of defective assimilation dependent on exhausted nervous energy, arising from overwork, mental strain, or venereal excesses.

The phosphatic is seen chiefly in the aged, or in the prematurely old of anaemic condition and shattered constitution.

In the largest proportion of cases where the diabetic diathesis occurs, no exciting cause can be assigned. A great degree of vagueness obtains concerning its origin; but among those causes alleged to have given rise to diabetes are numbered, shock, cerebral disease, exposure to cold, drinking cold water while in a heated state, mental emotion, blows on the face or thorax, sexual abuse, and, I might add, abuse of light causing retinal shock—all showing implication with some part of the great sympathetic nervous system, either within the cranium, or spinal cord, or its peripheral distribution.

I am aware that I give utterance to a novel view, when I call attention to the above statement, and declare that my

study of this disease especially inclines me to the conviction that diabetes should be classed among the neuroses, and that its varied phenomena result by reflexes from the nervous system, just as shock may temporarily arrest the secretion of urine. To my mind the disease obviously arises in the sympathetic chain which controls the secretory function of the kidneys. A wide and tempting field for investigation and discussion is thus opened, which I regret the limited time at my disposal prevents my entering upon.

Many believe that diabetes depends on some digestive impairment, the intestinal canal being particularly concerned.

In this connection it is very interesting to observe that the classic Dickson regarded the disease as a result of "some obscure vice of digestion and assimilation." If it primarily accounted for the presence of sugar in the urine, it would seem as if remedies addressed to a correction of this impairment would promise the best success in treatment. This view of the subject appears to have been taken by many, inasmuch as a review of the therapeutics of diabetes shows a remarkable leaning to remedies well known to possess a controlling effect on the function of the gastro-intestinal tract.

Though my experience inclines me to favour similar treatment, my interpretation of the effect, however, is, that it is realised rather through the nervous system than through any direct local consequence which antiseptics may exert in the digestive canal.

Harley gives us quite a practical view of the subject by verifying two great divisions in diabetes,—(1) including cases due to excessive sugar formation; (2) those due to diminished saccharine consumption. The first class of cases he considers most amenable to treatment; the second, especially fatal; on the principle, no doubt, that it is much easier to overcome the processes which result in sugar formation, than to get rid of the accumulation of sugar after it is once generated and the formative process well established.

Whether or not the impairment which excites excessive

saccharine formation originates in the liver, or is super-induced by some other functional disturbance reacting on the hepatic, is of little practical importance in the treatment. We must have in view the necessity of withholding in the one case material which facilitates sugar manufacture by the liver; and, in the other, the administration of appropriate medicaments to overcome that condition which permits of perverted function.

Remedies which have been found efficacious in some instances, have been such as could hardly be supposed to exercise any direct effect on the liver. Intestinal antiseptics, like antipyrin, salol, and peroxide of hydrogen, have been advocated as successful remedies. Nicolaier tried salol in seven cases of diabetes, and reported that its administration diminished the amount of sugar without dietetic restrictions, which appears to indicate (although he does not attempt to explain it) that while the salol may overcome intestinal fermentation, it nevertheless corrects, in some inexplicable way, the process of sugar formation.

Professor Bufalin found a strictly albuminous diet far more tolerant when thymol was administered, the good effect being undoubtedly dependent on the well-known antiseptic influence of this drug; but it is not explained that these effects are due to either a direct or a reflex action upon the intestinal nerve filaments. The development of sugar takes place in the stomach itself, where it has been found, and it has also been detected in the intestines and in the faeces.

There can be no question of the advantage to be attained by a judicious restriction of diet in assisting the treatment, and I have already laid great stress upon the fact that internal antiseptics play a most important rôle in the management of this disease. When due to excessive sugar formation the dietary is somewhat modified, as compared with that in cases associated with mal-assimilation. In the latter instance the body must be supplied with foods so easily digested that emaciation is retarded, while, at the same time,

the vital powers of the patient are sustained. In such cases, therefore, fats in the form of butter, cream, and fresh milk should be permitted, and it is sometimes advisable to give cod liver oil, the form of emulsion being best suited to the pancreatic complication of the disease. *Liquor potassae* or *sodae carbonate* dissolved in glycerin help to emulsify the fats and render them more readily absorbed along the intestinal tract.

To combat debility or very great loss of flesh, authorities agree that assimilable forms of saccharine substances should be given, believing that if we supply such nutritive elements when thus demanded, the chances of their assimilation are greatly enhanced and physical improvement proportionately follows; for the depression is supposed to be due, not to sugar in the blood, so much as to impaired power of its absorption.

Laevulose, the analogue of diabetic sugar, has been recommended by Kulz when indications for an added saccharine diet are present; also in those cases of excessive sugar formation where the subjects manifest physical and mental failure, the severe dietary restrictions should give way to a less guarded regimen, permitting brown bread, fats, fruits, and green vegetables.

The saline purgative and the alkaline non-purgative waters are serviceable to diabetics; the former acting by reducing saccharine supply in removing from the intestines ingested food before it has time to be absorbed and furnish the liver with material for the manufacture of sugar; the latter act as any alkaline medicament in emulsifying fatty foods and rendering them easy of digestion.

The narcotic and anodyne class of drugs have been more or less used and commended, but no rule can be laid down as to which it is best to use in all cases. When one preparation of the same drug, as opium for instance, will not succeed, another must be substituted.

Codeine, when tolerated, has long been in favour, and it is to be preferred to morphia or crude opium because of its less



disturbing effect on the digestive functions. It is stated that croton chloral, in combination with a vegetable narcotic, has given surprising results.

When it is desired to overcome nerve depression, great benefit may be expected from strychnine, nux vomica, quinine, nitro-glycerin, phosphoric acid, and cocaine in various combinations.

I will not attempt to give in detail the numerous remedies which have been from time to time suggested, but I would like to mention the pancreatic preparations tested by Drs. Mackenzie and Neville Wood. These preparations proved, in a general way, somewhat beneficial, but they had no effect in lessening the amount of sugar in the urine; they, however, served to modify thirst and reduce the quantity of urine passed.

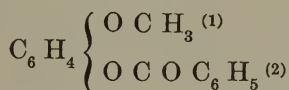
Dr. Hale White concluded that neither the feeding on fresh pancreas, nor the injecting hypodermically the liquor pancreasticus, was of such material benefit as to be a commendable mode of treatment.

From internal antiseptics, however, combined with judicious dietary restrictions I have realised the most beneficial results, the remedy which has most commended itself to me being benzosol or bensoyl-guaiacol, which has been also highly extolled by Piatkowski<sup>1</sup> in three valuable papers. My own experience with this drug fully justifies its use, and corroborates the observations of this distinguished authority. He found that, under this treatment, severe cases were transformed into mild ones, while in some patients the sugar entirely disappeared; the quantity of urine excreted was lessened and the specific gravity lowered. As to its mode of action, Piatkowski closes his report of cases treated with the reflection that it is far easier to propound theories than to justify them, and therefore refrains from stating whether or not the effect depends on the remedy's action on the pancreas, liver, blood, or the nervous system, which last, Marfuri held to be the first stimulated.

<sup>1</sup> *Przegląd Lekarski*, October 29 and November 6 and 19, 1892.

Whatever its action, and on whatever function exercised, benzosol certainly manifests a most potent influence in controlling elaboration of sugar; and, as it is tasteless as well as odourless, and at the same time a safe remedy to employ, it merits a high place among our therapeutic resources.

For the benefit of those who may not be familiar with this preparation, I will add that, benzosol (from benzoyl or thoxyanisol) is a compound of benzoic acid and guaiacol, and was first prepared by Dr. Bongartz. When pure it presents a colourless crystalline powder, odourless and tasteless, and melts at 50° C. The formula is,—



It is insoluble in water, barely soluble in hot glacial acetic acid, but readily dissolved by chloroform, ether, and hot alcohol. In the gastro-intestinal canal, but chiefly in the intestinal portion, benzosol is transformed into guaiacol and benzoic acid. The dose, gradually increased from one or more grains to fifteen grains daily, occasions no disagreeable effects; but it is apt to excite diarrhoea if carried up to one drachm daily. I have been in the habit of prescribing the remedy in capsules, commencing with a moderate dose of a grain or two, and gradually increasing it to ten or fifteen grains daily. In addition to lessening the manufacture of sugar, the effects observed have been, increased appetite, improved digestion and assimilation, with a perceptible stimulation of the nerve centres. In four diabetic patients I noted a total absence of sugar in the urine after three months' treatment, with proportionate improvement in the general health.

Though a marked benefit is derived from the use of benzosol alone, the best results are to be looked for in cases where a restricted diet is carefully followed with the additional administration of carbonate of lithium and Fowler's solution in vichy every morning, as recommended by Dujardin-Beaumez.

It will thus be seen from the foregoing remarks that the use of benzosol in the manner suggested serves the following useful purposes :

It stimulates the nerve centres.

It increases the appetite.

It lowers specific gravity of urine.

It controls the excretion of urine.

And lastly, modifies sugar formation, thus lessening the amount excreted.

#### DISCUSSION.

DR. J. G. TRUAX, of New York county, said he desired to add his testimony to the aetiology of the disease as laid down in the paper. It seemed to him that there could be no question but that some form of shock was almost always the cause of diabetes. He had frequently found a temporary glycosuria develop in cases of fracture of the long bones. After recovery from the injury there was no longer any sugar in the urine. There was but little doubt, also, that the digestive functions were impaired through defective action of the nervous system, and that this latter was the primary cause of the disease. All diabetics gave evidence of some form of indigestion. This symptom was the one most complained of, and the one which most often led the physician to suspect the presence of diabetes. His own experience would lead him to believe that the treatment advocated in the paper would prove very efficacious, for although he had not tried this particular remedy, he had, for a number of years past, been in the habit of prescribing remedies of a similar nature.

# BRIEF COMMENTS ON THE MATERIA MEDICA, PHARMACY, AND THERAPEUTICS OF THE YEAR ENDING OCTOBER 1, 1895.

By E. H. SQUIBB, M. D., of Kings County.

*Read by title October 15, 1895.*

It is hardly necessary to furnish a preface to these comments at this time, as their scope has been fully explained in previous years.

*Acetanilid* (antifebrin) is still one of the most largely used and efficient of the antipyretics, but continues to manifest symptoms of intoxication which at times become alarming. Its use in surgery has increased, as the allusion made here last year would lead one to foretell. At a meeting of the Philadelphia County Medical Society on February 13, last, Dr. Oscar H. Allis read a paper of Dr. Benjamin H. Brodnax, of Louisiana, on this agent as a dusting powder. He used it extensively, with equal quantities of powdered boric acid, in ulcers, burns, etc. In the discussion which followed, others expressed their satisfaction in this use of it.

Recently, Dr. Langdon Frothingham and Mr. Joseph H. Pratt published their interesting results in detail of a series of twelve experiments on "The anti-bacterial action of acetanilid," with the following conclusions :

"Although acetanilid has not been very widely employed as a surgical dressing, in the cases where it has been used, the results have been so successful that its superiority over iodoform seems very probable, and its use instead of the latter indicated. There is no danger of poisoning from absorption of acetanilid, and the utter absence of odour is an additional plea for its substitution for iodoform as a dressing.

"Laboratory experiments uphold the clinical proof of its value as a surgical dressing, but, since laboratory experiments are really no evidence of what goes on in the body, the only conclusions to be drawn from the foregoing experiments are :

"1. That acetanilid is probably, to a very slight extent, a germicide.

"2. That acetanilid is decidedly an antiseptic.

"3. That, as an antiseptic, acetanilid is far superior to iodoform, and that certainly from a laboratory, and probably also from a clinical, standpoint, its substitution for the latter seems warranted."<sup>1</sup>

Dr. T. S. K. Morton, of Philadelphia, Penn., has just published his observations in one thousand surgical cases with marked success.

At the medical society meeting above referred to, Dr. Brodnax included in his paper the subject of acetanilid *versus* quinine to abort chills and fever. This apparently was a pretty bold step, and he was criticised and questioned in the discussion which followed. He used it as follows :

"If there was time before the chill, he gave from a grain and a half to two grains of calomel, in quarter-grain doses, half an hour apart. Then, whether the bowels had acted or not, he gave, according to the age, from two to six grains of acetanilid twenty minutes or half an hour before the expected chill. Gentle perspiration, with sweet and natural sleep, usually promptly followed the administration of the drug, from which the patient awakened entirely relieved, and ready to go about in half an hour.

"When there was not time before the chill to administer the calomel, it might be deferred until afterward ; but the acetanilid could be given immediately before or during any stage of the chill or fever, with the happy result of promptly inducing sleep and gentle perspiration. Should the desired effect of the drug—viz., sleep and perspiration—not follow its administration within half an hour, a second dose of equal amount should be given.

"The after-treatment consisted of the use of an acid tonic, such as a solution of eighty grains of sulphate of iron in a fluid ounce of dilute hydrochloric acid. This should stand for twenty-four hours. Ten drops, in water, should be given three or four times a day.

"The author had now treated several hundred cases of chills with acetanilid, and without quinine, and reported his success in the hope that others would be induced to give it a trial."<sup>2</sup>

*Acid Carbolie* (phenol) still continues to interest all observers, especially to determine the cause of the alteration in colour. Dr. A. Bach, of Germany, has now apparently pushed investigations in regard to this subject, directly in the line of those of Dr. Chas.

<sup>1</sup> Amer. Journ. of the Med. Sciences, vol. cx, p. 146.

<sup>2</sup> N. Y. Med. Journ., vol. lxi, p. 380.



A. Kohn, of Liverpool, England, and alluded to here last year, only he has gone a step further. He recognises that it has been claimed that the alteration was due to the formation of hydrogen peroxide, and he himself agrees with previous observers in usually finding it in the altered acid, but from his experiments, he tries to show that the colouration is due to the presence of carbonic anhydride (CO) and not of hydrogen peroxide. He "found that when phenol is exposed to the action of light and moisture in an atmosphere of carbonic anhydride, it is quickly turned red, and no trace of hydrogen peroxide can be detected. On the other hand, when phenol is exposed to light and damp air, and care is taken to exclude carbonic anhydride, after three days only a faint, brownish colouration is observed, and hydrogen peroxide can then be detected by its characteristic reactions."<sup>1</sup>

*Acid Citric* has recently been prepared from cane sugar by Dr. T. L. Phipson, of the Casa Mia Laboratory, Putney, England. He claims to have produced it by the action of a strong solution of potassium permanganate on a solution of sugar which has been acidulated with a few drops of sulphuric acid. Ammonia is next used to neutralise, and calcium chloride added. Upon boiling, a calcium precipitate falls which is decomposed with sulphuric acid, and the resulting solution is evaporated down to the crystallising point, when small, well-formed crystals of citric acid appear. He afterward published a second note in which he calls attention to the fact that Liebig "had formerly announced that he had obtained tartaric acid by the action of dilute nitric acid on sugar." He further adds that he had "found that in the grape, the apple, etc., these acids disappear as the sugar is formed, from the outside to the inside of the fruit, and that the remaining acid is concentrated around the seed, probably acting as an antiseptic until germination ensues. It is thus evident that organic acids are formed in fruits before the sugar is formed, and that the sugar may possibly be derived from them. Nevertheless, the ease with which sugar is converted into carbonic acid, formic acid, oxalic acid, etc., and its original production from the starch of the seed during germination, points to the possibility of all other organic acids devoid of nitrogen being obtainable from sugar.

"In treating cane sugar in the cold with permanganic acid, as described in my first note, I obtained an acid having some resemblance to citric acid, but no sufficient quantity was obtained to prove its real nature, and I have since been unable to repeat this

<sup>1</sup> Journal of the Chemical Society, (British), vol. lxviii, p. 340.

experiment, but hope to do so shortly. I found, however, that other acids are liable to be formed at the same time, according to the degree to which oxidation is allowed to proceed.

"Some chemists, who have repeated my first experiment, have only succeeded in obtaining sulphate of lime. Probably they used too much sulphuric acid, and did not separate the organic acid by alcohol as I did."<sup>1</sup>

*Acid Picric* (tri-nitro-phenol) continues to be used as a delicate test for albumen, and in addition to its use in the treatment of burns alluded to here last year, it has now given reported excellent results in the treatment of lupus. Dr. T. Spannocchi, of Città di Castello, Italy, reports having prepared the affected regions thoroughly by curetting, and then dusted the raw surfaces with the finely powdered acid, over which is applied a dry, antiseptic dressing. A superficial crust forms, which leaves a healthy-looking, granulating surface after two or three days. Vaseline, with 10 per cent. of picric acid incorporated in it, is then applied. Later, the acid strength is reduced to 5 per cent., and continued until complete cicatrization is accomplished. Dr. Spannocchi has also met with success when applying the powdered acid in cases of osseous tuberculosis.

*Acid Salicylic* has recently been very markedly reduced in price, chiefly due to the fact that Kolbe's patent has expired, and the manufacture of the acid has been undertaken by many competing firms. It is reported, however, that the acid now on the market has shown, in several cases, the presence of salol, formed by careless distillation. The odour of salol is particularly noticeable in the acid after being confined for a time in a closed package.

*Acid Sodium Borate*—brought forward last year, as if new, under the odd name of antipyronin—has met with increasing usefulness as a most effective antiseptic to the ophthalmologist and aurist. It surely deserves to be used more widely, for nothing but success has attended its use, and for reasons which are very rational when considering its composition.

*Acid Trichloracetic* continues of much value as a reagent for the determination of albumin in urine, but it has expanded its sphere of usefulness considerably since it was first employed as a test, several years ago. Prof. C. Posner now recommends the administration of from five to ten drops, three times a day, of a 20 per cent. solution of this acid, in distilled water slightly sweetened, for correcting the alkalinity of the urine in chronic cystitis.

<sup>1</sup> Chem. News, vol. lxxii, p. 100.

Dr. Kossolino recommends a 3 per cent. solution, in persistent epistaxis, as controlling the haemorrhage immediately. A 20 per cent. cocaine hydrochlorate solution may be previously used to allay the sharpness when the acid is introduced upon a cotton tampon.

*Agathin* (salicyl-aldehyde-à-methyl-phenyl-hydrazone) still continues to be used as an analgesic in some quarters, but little is heard of it outside of the manufacturer's advertisements. It is there claimed to have been tried, apparently successfully, in obstinate cases of sciatica.

Dr. E. Rosenbaum reiterates his recommendation of it in neuralgia, and cites additional cases. His usual dose is about 500 milligrammes (about eight grains).

*Airol* is the odd name given by Dr. F. Lüdy, of Basle, Germany, to an oxy-iodogallate of bismuth prepared, under a patent as usual, by a firm in Basle as another substitute for iodoform. Chemically it is bismuth subgallate (dermatol) in which one of the hydroxyl radicles is replaced by iodine. It is a fine, greyish-green, odourless and tasteless powder, unaffected by sunlight, but gradually decomposed by moisture to a more basic red powder. It forms a fairly stable emulsion with glycerin and water. It has been used successfully in the powder form, and as an ointment with vaseline, dehydrated lard, or cocoa butter, in ulcers of the leg, principally. Dr. J. Fahm, of Basle, reports excellent results, not only externally in burns and varicose ulcers, but internally in a twelve year old girl suffering from tubercular enteritis, administered in doses of 200 milligrammes (about three grains) twice in twenty-four hours.

*Alphol* (*a*-naphtyl salicylate) has not appeared anywhere in the prominent medical journals of the year, and the "prognosis" of last year, that there seemed little need for its presence, is probably fulfilled, especially as it was noted that the therapeutic effects were similar to the older agents, salol and betol.

*Alummol* has received little attention in the current medical literature of the year past. It continues to be used, however, in cutaneous affections, and it is stated that the ophthalmologist will find it of service in temporarily checking the lachrymal secretion during an examination of the eye, by dropping in a few drops of a 4 per cent. solution.

*Aminol*, the new antiseptic and deodoriser in the form of a gas, alluded to here last year, has not yet been reported on further, but the experiments instituted in England last year are still going on, and a report may be looked for before long.

*Ammonol* is a new antipyretic and analgesic, claimed to be an ammoniated phenylacetamide having unusual stimulating and expectorant properties, due to the loosely combined ammonia present in its composition. It is a very fine, slightly yellowish powder, evidently crystalline in form. It is claimed to be of service "chiefly in the relief of rheumatism and neuralgic pains, and in the treatment of the sequelae of alcoholic excess." The ammonia present gives it additional claims "as an expectorant, diuretic, and a corrective of hyperacidity." The bromide, peptonate, and salicylate are offered. Practically, nothing has been written upon it as yet in the current medical journals, as its introduction has been confined to the distribution of circulars and samples to physicians, by the enterprising firm who are introducing it.

*Amyl Acetate*, prepared by the reaction between acetate of lime and sulphuric acid and amylic alcohol (fusel oil), is the basis of several of the artificial fruit essences. A new use is now reported. If one per cent. of a 95 per cent. amyl acetate solution be added to kerosene it will almost entirely destroy or mask the characteristic, but disagreeable, odour noticed in a room where kerosene is burned. This fact may be made good use of in the sick room where the peculiar kerosene odour is often nauseating to the invalid. This claim is doubted by many after a practical trial.

*Antidiphtherin* of Klebs is heard of no longer, and all attention is interestingly focused on

*Antiphthisin*—a new culture whose name signifies its use. It is claimed by Prof. Edwin Klebs (now of Asheville, N. C.) its introducer, that it is "tuberculin in a purified form," and he so stated in the discussion which followed the reading of his paper on this agent in tuberculosis in children, at the last meeting of the American Medical Association, held in Baltimore, Md.

Dr. Charles Denison, of Denver, Col., has since made a report on this new tuberculin derivative, and relates two cases out of a number he has treated. He describes this agent as being "very much like tuberculocidin (Klebs), though differently prepared. Instead of being made from tuberculin, it is made directly from the ten-times-concentrated culture fluid of tubercle bacilli, the toxic principles which tuberculin contains being supposedly excluded. It is thus claimed to represent the soz-albumin—the probable germicidal property in tuberculin—as much as exists in an equal quantity of tuberculin; and its special value depends upon the fact that a larger dosage is allowable without the injurious toxic effects to be expected from large doses of tuberculin."

After giving what is considered to be its composition, he continues : "When, last December, I was asked to give the remedy a thorough trial, I was requested by Professor Klebs 'that you will not try the remedy except in cases of pure tuberculosis, and exclude from the treatment for the present, cases of mixed infection, and septic cases, and of course all such as have amyloid or are so far reduced physically that they necessarily must die of the complications or exhaustion already present.'

"In regard to such exclusion I must explain that it is very hard to make it work. For instance, there are very few cases which come to a health resort like Colorado in whom there is not some 'mixed infection.' Therefore, as my object has been to help my patients more than to prove the uniform efficacy of the remedy, I have followed my natural inclination to give some almost hopeless invalids a chance. I conceive that the best test of a remedy is not that it will work well (as is claimed for all so-called cures, climatic or otherwise) in incipient non-febrile cases, or as usually erroneously stated, 'in the first stages ;' but the proper test is that it has some specific effect upon the disease as we most often find it ; and that is after there has been more or less breaking down of lung tissue. Climate, with right living, can take care of those other cases, but we need a remedy which without injury to a far-gone consumptive will give him, on the lines of more or less permanent immunity to tuberculosis, the benefit of his 10 to 30 per cent. chance of arresting his disease, if in fact that slim chance is his. I believe that somewhere, within the range of the remedies here discussed, that boon resides, if we can only get at it ; and antiphrasin seems to be the nearest approach to it yet proposed."

Then shortly follows the detailed account of two out of the twenty-three cases he has thus far treated. Dr. Denison desires his present report to be considered as preliminary only.<sup>1</sup>

Many observers are now experimenting with this agent and no doubt much will be heard later.

*Antipyronin* will now be found under its more scientific title, "acid sodium borate."

*Antipyrin* (phenazone) continues to receive marked prominence not only in the medical profession, but, it is to be much regretted, likewise among the laity, for considerable harm is being repeatedly done by its popular use—even poisoning cases being all too frequent.

Cases continue to be reported of peculiar susceptibility of some

<sup>1</sup>N. Y. Medical Record, vol. xlviii, page 78.



patients, aside from the erythematous rash noticed by the majority of observers.

Repeated mention is now being made of its remarkable hemostatic effects.

Dr. F. Arnstein reports its successful use in two cases of obstinate pruritus when given internally in one gramme (15.4 grains) doses at bedtime. Other methods of treatment had apparently failed, but in conscientiously carrying out this treatment for two weeks the itching was entirely relieved.

Dr. T. McCall Anderson, of Glasgow, Scotland, has reported "On the Use of Antipyrin in Large Doses." He gives the full details of his three cases, stating that they "are good illustrations of the benefits which may be derived from the use of antipyrin in large doses, and the comparative safety with which it may be given, although such cases must be carefully watched, and the initial dose should not exceed ten, or at most fifteen, grains."

His conclusions are as follows :

"1. Antipyrin is not the dangerous drug which some observers have led us to suppose.

"2. It may be given with safety in large doses, even in the case of children, in most cases, although the initial dose must be small, and it must be slowly and cautiously increased, the patient always being carefully supervised.

"3. In large doses it often yields surprisingly good results, and in chorea it is the only medicine from which cures may confidently be anticipated."<sup>1</sup>

In the same doses that Dr. Anderson administers, Dr. W. Gilyard Scarth, of Leeds, England, has met with marked success in its use as an analgesic by giving "two or three doses every four hours or so . . . ." In conclusion, he ventures to say "that its harmful effects (as far as my own experience tends) are practically *nil*; further, that when combined with diffusible stimulants, any untoward result is reduced to a minimum. As regards idiosyncrasy, antipyrin will compare very favourably with the salicylates, iodides, and quinine. Profuse perspirations and an erythematous rash have been noticed once or twice. It is to be regretted that such a valuable drug as this should be so largely in the hands of an indiscriminate public."<sup>2</sup>

A warning is sounded by Mr. A. H. Frere, of Menston, England, of the danger of this agent in influenza, and he claims far better

<sup>1</sup> Brit. Med. Journ., vol. ii, for 1894, page 1227.

<sup>2</sup> Brit. Med. Journ., vol. ii, for 1894, page 1416.

and safer agents are at hand in the old reliable iron tonics. On the other hand, others claim the opposite results, but certain correctives must be employed to nullify the disappointing effects.

Dr. Ivanoff highly recommends the following formula in croupous pneumonia :

Antipyrin . . .	2.00 grammes (about 31 grains)
Pulverised camphor . . .	0.50 " ( " 8 " )
Morphine hydrochlorate . . .	0.02 " ( " $\frac{5}{16}$ " )
Powdered sugar . . .	9.50 " ( " 146 $\frac{1}{2}$ " )

Three grammes (about forty-six grains) to be given every one or two hours.

Dr. Rehn, of Frankfort-on-the-Main, Germany, reports success in the use of antipyrin phenyl-glycollate in the treatment of pertussis. In the use of 100 milligrammes to 1 gramme (about 1 $\frac{1}{2}$  to 15 grains), according to the age of the child, he obtained complete recovery in from three to five weeks, according to the gravity of the case. Anything like milk or alkalies which decomposes this salt must not be given in conjunction with it.

*Antirheumatin* (methylene blue+sodium salicylate) has not been heard of during the past year.

*Antispasmin* has received more attention than last year, but practically nothing has been accomplished with it in this country as yet. The price is still very high, which retards its general use.

Dr. F. Frühwald has obtained satisfactory results in the treatment of pertussis. He used it in over two hundred cases with no ill-effects upon the alimentary tract, nor did he notice any cumulative narcotic action even in very young children. In general he noticed prompt reduction in the number and severity of the attacks and some shortening in the duration. A 5 to 10 per cent. solution was used, protected from the light in a blue glass bottle.

Other observers, however, report that it is very uncertain, and has no therapeutic value sufficient to justify its use, at least among adults. It apparently does not give much promise.

*Antitoxin*, as might naturally be inferred, has received most marked attention throughout the past year, pretty much all over the world, particularly in its relation to the treatment of diphtheria. The literature is very voluminous, and it would be time ill-spent to even attempt to partially enumerate the cases reported and the individual opinions of those who have made use of it. There are, of course, some observers who have obtained unsatisfactory results and cannot agree to the wholesale claims of the enthusiasts, but it has been expressed on more than one occasion that impartial

observers have to acknowledge either that diphtheria has, during the year 1895, assumed a milder type (an assumption which will be admitted by few), or that antitoxin has proved an unmistakable blessing. The results thus far achieved cannot be better expressed than in the words of Dr. Malcom Morris of London, England, when he says "they appear to me to give solid ground for the hope that at last a real antidote to this bane of child-life has been discovered. Of course, in estimating the value of any new remedy which excites the enthusiasm of the profession, it is always well to leave what dressmakers, I believe, call a 'margin for shrinkage.' The weak point in the new treatment, to my mind, is that it is too successful; its effects are painted in colours too brilliant not to fade a little by-and-by. One of the lessons which the philosophy of medical history teaches is that a *new remedy always cures*."

"It is never an easy matter to arrive at a correct estimate of the value of any new method of treatment, and in the case of antitoxin, the difficulty is increased by the very favour with which it has been received. Enthusiasm in one quarter is sure to beget contradiction in another; passions are aroused, and the scientific judgment is blinded by prejudice, and perhaps by envy and all uncharitableness. There is, besides, the statistical fallacy, which has to be guarded against with especial care in the case of diphtheria. By making no distinction between true diphtheria and the affections which simulate it, or between mild and severe forms of the genuine disease, statistics have been compiled showing the most brilliant results,—even 100 per cent. of cures,—from perchloride of iron, corrosive sublimate, carbolic acid, menthol, salaktole, and a host of other substances.

"Only cases which satisfy the bacteriological test,—that is to say in which Löffler's bacillus is found,—can be accepted as examples of true diphtheria; and I am glad to see that a recognition of this fact is to form the basis of the investigation of the action of antitoxin undertaken under the auspices of the Metropolitan Asylum's Board. With regard to the other source of confusion which has been referred to, every practitioner knows that there are many cases of true diphtheria of so mild a type that no *Deus ex machina* in the form of immunised serum is required to cure them. They get well with any treatment, and even with none. It is obvious that a number of such cases, if placed to the credit of the antitoxin method, may give a very erroneous notion of its healing power. In a matter of this kind, unless observations are weighed as well as counted, statistics are simply a delusion and a snare.

“Still, when every possible allowance has been made for exaggeration and error, a sufficient solid residuum remains to make the discovery one of the greatest of modern times. It is far more than the establishment of a fact; it is the practical realisation of an idea which will, there can be little doubt, be fruitful of results in the cure and prevention of infectious diseases for which we yet hardly dare to hope.

“It is curious that though the credit of the discovery belongs to a German, it is in Germany that the method has been most severely criticised. The violent attack made on Behring and all his works, by Hansemann, at the Berlin Medical society a few weeks ago, derives most of its importance from the fact that the critic is Virchow’s assistant. The father of modern pathology has never bent his knee with a good grace in the worship of the bacillus. He was the chief agent in the demolition of Koch, and he is believed to be as little friendly to Behring. The personal factor plays so large a part in the whole business in Germany for the moment as, to a certain extent, to obscure the scientific issue. Perhaps, too, our German friends feel that they were a little carried away by scientific *Aberglaube* at the time of the great Koch ‘boom,’ and find in the recollection of tuberculin a useful corrective of any tendency to premature enthusiasm about antitoxin.<sup>1</sup>”

In our own country, Dr. Wm. H. Welch of the Johns Hopkins hospital has very recently published an important and painstaking paper, bringing the subject quite up to date, and this is well worth the perusal of all those who are at all interested in the subject. He concludes as follows: “The principal conclusion which I would draw from this paper is that our study of the results of the treatment of over 7,000 cases of diphtheria by antitoxin demonstrates beyond all reasonable doubt that antidiphtheric serum is a specific curative agent for diphtheria, surpassing in its efficacy all other known methods of treatment for this disease. It is the duty of the physician to use it.

“The later reports show in general a decided improvement in the results of the treatment over the earlier ones, and there is every reason to believe that the results of the second year’s employment of the new treatment will make a much more favourable showing than those of the first year. We shall come to a clearer understanding of the mode of action of the healing serum. Improvements in the methods of preparation and preservation of the serum, and possibly the separation of the healing substance, at

<sup>1</sup> London Practitioner, vol. liv, p. 47.

least from other ingredients which produce the undesired effects, may be expected.

"The discovery of the healing serum is entirely the result of laboratory work. It is an outcome of the studies of immunity. In no sense was the discovery an accidental one. Every step leading to it can be traced, and every step was taken with a definite purpose and to solve a definite problem.

"These studies and the resulting discoveries mark an epoch in the history of medicine. It should be forcibly brought home to those whose philozoic sentiments outweigh sentiments of true philanthropy, that these discoveries, which have led to the saving of untold thousands of human lives, have been gained by the sacrifice of the lives of thousands of animals, and by no possibility could have been made without experimentation upon animals."<sup>1</sup>

From the very evident misapprehension among the majority of the laity and, curiously enough, among some members of the medical profession, Dr. Morris has thought it expedient to write: "It may not be inappropriate to point out that the tuberculin differs essentially from the serum treatment. In the former case the remedy used was composed of poisonous matter extracted from the bacilli which are the agents in producing the disease to be treated; in the latter the remedial substance is the serum of animals immunised against the disease by the injection of analogous poisons. The serum treatment rests on a much more solid basis than the tuberculin method, and the comparative failure of the latter in no way lessens the hopefulness of the former. Let us, however, be quite clear as to what antitoxin can, and what it cannot, do. It is essentially an antidote to a specific poison; that is to say, it can neutralise the action of the poison, but it has no effect on the organic changes and functional disturbances caused by the poison. If used in time, antitoxin may, with tolerable confidence, be expected to prevent the occurrence of such changes and disturbances, but it cannot cure them. It is unreasonable, therefore, to look for any marked improvement from the use of the serum, when the presence of albuminuria, cardiac weakness, or broncho-pneumonia, shows that vital parts of the organism are already, as it were, in the occupation of the enemy, and when other pathogenic microbes have joined their forces to those of Löffler's bacillus.

"Nor must it be imagined that the antitoxin is an unfailing specific. All that Behring himself claims for it is stated in the follow-

<sup>1</sup> Johns Hopkins Hosp. Bulletin, vol. vi, p. 97.



ing sentences, which I translate from an article by him recently published in the *Zukunft*:—"I am now definitely of opinion that under suitable treatment with my remedy the mortality from diphtheria may be reduced under 5 per cent. if the serum be used in good time—that is, before the third day of illness. There should be no difficulty about this if care be taken that the remedy is everywhere at hand. There are also sufficient reports to show that the serum may be used with success even after the third day; but it cannot be too often repeated that this can only be the case when a multiple of the ordinary curative dose is given, when the danger to life is due to the diphtheritic process, not to infection with other matters, and when further immediate danger from obstruction of the respiratory passages is relieved by tracheotomy or intubation.' This clearly defines the present position of the question as to what antitoxin can, and what it cannot, do, and there for the present I leave it."¹

The encouragement given by this diphtheria treatment has stimulated experiments toward ascertaining whether this method is applicable to other forms of disease. Thus it has been tried in cases of cancer and sarcoma, but without definite results as yet. However, in rabies, tetanus, and snake bite much more encouraging results have been obtained.

Dr. Richard T. Hewlett, M. R. C. P., assistant bacteriologist, British Institute of Preventive Medicine, has written an article on "Tetanus Antitoxin; Its Preparation and Properties," in which he concludes as follows: "The antitoxin treatment of tetanus would seem to be the one which gives the best hope of cure, though it can hardly be so successful as the corresponding treatment for diphtheria is reported to be. The explanation of this is that tetanus is only recognised as being tetanus at a late stage, when the toxins are circulating in the blood; the disease is far advanced before it can be diagnosed. Gowers estimates the mortality in traumatic tetanus at nearly 90 per cent., and in idiopathic at 50 per cent. I have been able to collect records of 42 cases of tetanus treated with antitoxin, nearly all traumatic, and of these 15 died and 27 recovered, giving a mortality of about 36 per cent. If these figures can be relied on, the result is encouraging, but the tendency is always to report successful cases only. The antitoxin must be administered by subcutaneous injection. It is difficult to state what the dose should be, for this has varied enormously in the recorded cases, from 10 c.cm. to 165 c.cm. Probably 20 c.cm. to 40 c.cm. for a first dose,

¹ London Practitioner, vol. liv, page 49.

followed by 10 c.cm. every six or twelve hours, would be found most suitable.

"Of the dry antitoxin, 1 gramme corresponds to about 10 c.cm. of serum, so that the dose of this would be 1 to 4 grammes. If reduced to an impalpable powder, it dissolves fairly readily, 1 gramme to every 5 c.cm. or 10 c.cm. of sterilised distilled water."<sup>1</sup>

The latest application of the method of treating snake bite with its appropriate antitoxic serum (Antiverene) is interesting. Professor T. R. Fraser, F. R. S. of Edinburgh, in the *British Medical Journal* (Vol. I, for 1895, page 1309; and Vol. II, for 1895, page 416), elaborates his results with the serum of animals rendered immune to the poison of the cobra, rattlesnake, and other poisonous serpents, representing the most deadly of the ophidia of Asia, America, Africa, and Australia. Through the labours of many investigators, including Kaufmann and Sir Joseph Fayrer, it has been proved that animals can be rendered proof against snake poison by the repeated administration of graduated doses of the venom. Professor Fraser has confirmed these results, and has proved in addition that the blood serum of animals thus rendered immune possesses definite antidotal properties. Experiments were made with the venom of each of the four varieties on guinea-pigs, rabbits, and other animals, and the minimum lethal dose per kilogramme of the weight of each kind of animal was ascertained. This dose was found to differ greatly in the different animals. For instance, in guinea-pigs, in the case of cobra venom, it was 0.00018 gm., while in the cat it was somewhat less than 0.00025 gm. Thus the author points out that the poison rivals in its lethal powers such active vegetable principles as aconitine and strophanthin. When the resistance of the animals had been increased by the administration of graduated doses short of the minimum lethal, it was found that four or five times that amount could be given and "still the animal suffered little, and, in many cases, no appreciable injury."

*Apolysin* is the odd name given by Drs. L. de Nencki and J. de Javorski, of Warsaw, Russia, to a new analgesic and antipyretic closely allied to phenacetin, the difference being that acetic acid is combined with phenetidin in the latter, whereas in this agent citric acid is used. It is a fine, yellowish-white, crystalline powder slightly acid to the taste and an acid in chemical reaction, having a slight odour and difficultly soluble in cold but readily in hot water. Lithium, magnesium, and sodium salts have already been made, any of which may be selected to suit individual cases.

<sup>1</sup> Brit. Med. Journ., vol. i, for 1895, page 464.

Drs. Nencki and Javorski have investigated its therapeutic effects in quite a wide range of cases of croupous pneumonia, scarlatina, typhoid fever, influenza, puerperal fever, pyaemia, follicular tonsillitis, migraine, facial erysipelas, sciatica, headaches, and various forms of neuralgia, in doses not larger than 6 grammes (about 92 grains), daily—single doses from 500 milligrammes to 1.5 grammes (about 8 to 23 grains). It has the great advantage over phenacetin and analogous agents in being much more soluble and therefore producing beneficial results more certainly and rapidly. In cases of neuralgia it acted apparently as an anodyne, diminishing the hyperaesthesia and perceptibly shortening the duration of the attacks. No unpleasant effects were felt, and at times even all the disagreeable symptoms disappeared after its administration.

Care must be taken not to give it on an empty stomach or in other cases when the secretion is very acid, as decomposition results.

*Argentamin* is the name given by E. Schering to a salt of silver which he has obtained by treating a solution of 10 parts of silver phosphate with 10 parts of ethylene-diamin in 100 parts of water. It is less irritating to the mucous membrane than silver nitrate, but not so free from this objection as argonin. It is decomposed by exposure to light, but the silver present does not precipitate with chlorides and it itself does not precipitate albumen.

Dr. Schäffer, of Breslau, Prussia, has found clinically that it acts more energetically than a silver nitrate solution of the same strength—in destroying pathogenic microbes more thoroughly and penetrating more deeply into the tissues. Drs. Schäffer, Lang, Albertazzi, and A. Aschner have all used it with good results in gonorrhoea, abscesses of glands and of the connective tissue. The solutions used varied from 1 in 4000 to 1 in 1000.

*Argonin* is the very misleading name given to a new bactericide—a silver preparation which has marked claimed advantages over the other silver salts in some uses, particularly as being far less irritating to the mucous membrane than the nitrate, for instance, or even argentamin. It is not, as might naturally be inferred, even remotely connected with argon, the recently discovered element in the air. It is prepared according to a process devised by Drs. Oscar Liebreich and Röhmman, of Breslau Physiological Institute, Prussia. It is obtained by mixing a compound of sodium and casein with silver nitrate and then throwing down the argonin with alcohol in the form of a fine, colourless precipitate, readily soluble in hot water but not in cold. A 10 per cent. solution can be made which is neutral, slightly yellowish in colour, and

easily decomposed on exposure to light, but the silver in the compound is not precipitated by chlorides, ammonium sulphide solution, or the usual reagents. As to the relative quantity of silver represented, 15 grammes (about 43) of argonin are equivalent to one gramme (about 31 grains) of silver nitrate.

Drs. Rudolf Meyer and J. Jadassohn, of Breslau, both recommend it as an efficient disinfectant. Dr. Meyer's researches have already shown that it has remarkable microbicidal action, especially on the gonococcus. Both these observers are still at work on the subject. It is too early yet to expect other clinical observations.

*Aristol* (annidalin) still not only holds its own in usefulness in the various skin affections, ulcers, burns, keratitis, and nasal affections, but has been successfully employed by the otologist and ophthalmologist in a more general way. Several observers have obtained very gratifying results in otorrhea, and in long existing corneal ulcers. On account of its non-irritating properties, it is recommended as preferable to yellow oxide of mercury in these corneal ulcers.

It is reported, however, by Dr. S. S. Grouzdew, that irritation was intense at the point of injection, when used hypodermically in the treatment of twenty-five cases of pulmonary tuberculosis. Ultimate good results were obtained, however, after these injections, which were in the form of a solution in oil, varying all the way from 1 to 15 per cent. One cc. (16.2 minims) injection was given each day.

*Asaprol* (calcium  $\beta$ -naphtol- $\alpha$ -mono-sulphonate) is still used, but apparently not very extensively as far as the current literature would indicate. Its principal advocate during the year past has been Dr. Moncorvo, of Rio de Janeiro, Brazil, who claims to have made an extended trial of it in various childhood affections. He pronounces it a very useful and successful agent. In healthy children it apparently does not alter the temperature, respiration, or digestion, but in acute infectious diseases it lowers the temperature and pulse rate, and increases the secretion of urine, particularly in malarial fever cases. Dr. Moncorvo has no hesitation in stating that there is no doubt about its being efficacious in malarial fever. Not only is the temperature lowered but the type of the fever is rapidly modified. It gives rise to less profuse perspiration than antipyrin.

Besides its antipyretic, analgesic, and antiseptic effects, it may be successfully used as a hemostatic. This use has not been noted before.

Although the taste is at first bitter it rapidly changes to sweet, and is thus not difficult to administer to children.

*Benzanilid* is the product which is closely allied to acetanilid chemically, and has been claimed to have similar therapeutic effects, but little has been proven clinically as yet. An improved method of preparation has now been offered which may stimulate its use. It was previously made by combining, under certain conditions, benzoic acid and anilin, giving a colourless and odourless crystalline powder. It is now proposed to combine benzoic chloride with an excess of anilin, and finally removing the excess. Sublimation then gives a very satisfactory product.

Practically nothing of value is known of this agent clinically as yet.

*Benzol* (benzene), although now so well known, has received no special notice in the medical literature.

*Benzonaphtol* ( $\beta$ -naphtol benzoate) has continued to be successfully used throughout the year as an intestinal antiseptic. Dr. H. Huchard has recommended it to be used in conjunction with powdered charcoal and pancreatin made up into cachets, but it looks probable that the last ingredient might be omitted as far as beneficial effects go.

Dr. José A. Clark reports his success with it in an epidemic of dysentery occurring in Alquizar, Cuba. The total number of cases under his care was 137—of which 23 were serious and 114 mild. His mortality among those treated with ipecac, calomel, opium, and the other usual agents reached 9 per cent., and with benzonaphtol just over 2 per cent. By the use of this agent the cases not only made more rapid progress, but did not experience the usual accompaniments, vomiting, salivation, or depression of the circulation; three grammes (about 46 grains) a day were given to adults, and about the same to children.

*Benzosol* (benzoyl guaiacol) has not been reported upon during the year.

*Bismuthol* is the name given by Dr. Radlauer to what is probably a mixture of bismuthsalicylate and sodium phosphate with the other possible chemical combinations of the above salts, although it is described as a definite chemical compound. It occurs in fine, colourless crystals, without odour, and with an agreeable taste. It is claimed that it gives all the beneficial effects of its component elements and none of their disagreeable ones, as a combined antiseptic, antipyretic, and disinfectant. When dusted on in a powder of one to four with talc in the treatment of cuts, open wounds,



burns, ulcers, and skin affections, it does not irritate. It is used also successfully in a one to four vaseline ointment.

Nothing has been reported on it in this country as yet.

*Brassicon* is the fanciful name given to a combination of ingredients recommended for headache. The paragraph announcement gives no quantities or directions, but simply states that it consists of camphor, peppermint oil, ether, oil of mustard, and alcohol.

*Bromalin* is the contracted name given by the manufacturer to brom-ethyl-formin — a combination of brom-ethyl and formin — previously introduced by Bardet and recommended in the treatment of epilepsy and other nervous affections.

Dr. Leopold Lagner, who appears to be the only observer who has made any systematic use of it, reports that it does not produce some of the very unpleasant effects of the usual bromides, and therefore is preferable and especially serviceable in women and children. It requires just twice the quantity to control an epileptic attack as potassium bromide, for instance, as the latter contains a little more than twice the bromine. It occurs in colourless, scaly crystals, is more soluble than the usual bromides, and has a less disagreeable odour and taste.

Mons. Ch. Féré, M. D., had previously used it, and Dr. Lagner now does little more than confirm his results.

*Bromides* in other forms than the usual ones are still under investigation. Gold bromide even has been used in several cases with reported success. Strontium bromide is now by no means new, but on the other hand more practitioners are recognising its usefulness.

Mr. Antony Roche, M. R. C. P. I., of Dublin, Ireland, reports on the use of the strontium salt in epilepsy as follows: "It has been found in some cases to afford some relief in reducing if not curing the manifestations of the condition. I regret the number of cases is limited, and that therefore no general deduction can be drawn from them; but I think they are sufficiently encouraging to induce others to give this bromide a trial in suitable cases. My attention was drawn to the use of bromide of strontium some two years ago by reading some reports from the French medical papers in which it had been found useful when the other bromides had no beneficial effect or could not be borne. I determined to give it a trial in a case I had then under my care, and found the results so satisfactory that I have since used it alone or in combination with the other bromides in four cases."

He then relates his cases in detail, giving in one case the strontium salt alone, while in the remaining three he gave the potassium and strontium salts in combination. He concludes as follows: "None of these cases were cured, but all of them much relieved. In all of them other bromides had been employed before, and the combination of the strontium seemed to be more beneficial. It has long been noticed that a combination of the bromides acts more favourably than any one, and I would advise you to impress on the patient that he must take the medicine for a long period, whether it has at first a beneficial effect or not. I think the bromide of strontium well entitled to further trial."<sup>1</sup>

Dr. W. E. Stainton Stanley emphasises the fact that few give large enough doses, contenting themselves with about 450 milligrammes (about 7 grains), whereas the proper dose should be 2 grammes (about 31 grains), and again he approves of what he calls the American practise of combining it with a fair dose of eserine. He masks the nauseous effects with glycyrrhiza. He closes by saying: "The worst case of cholera I have seen was greatly benefited by this mixture."

Dr. B. D. Evans, medical director of the Morris Plains Hospital (Insane) at Morristown, N. J., takes occasion to state in his last annual report on what he calls the "House 'Sleeping Mixture'" as follows:

"A favourite hypnotic with us in cases where there is marked psychomotor excitement is a mixture we sometimes call bromidia from its resemblance to the proprietary preparation of that name. It is given in one or two fluid-drachm doses. Each drachm contains sodium bromide, fifteen grains; chloral hydrate, fifteen grains; tinct. cannabis indica, four minims; tinct. hyoscyamus, four minims; glycerin, fifteen minims, and water sufficient to make up the fluid drachm.

This preparation has best served us in actively-acute maniacal conditions, and in the restless, sleepless, and excited condition which frequently follows a series of epileptic fits in epileptic insanities. Not infrequently headache, loss of appetite, and dull, heavy feelings about the head follow its use, though in the class of cases above cited it acts very satisfactorily."

Dr. K. V. Polakoff, of Russia, has recently made good use of lithium bromide in the treatment of 22 cases of acute and chronic parenchymatous nephritis. He finds that it acts as a certain and powerful diuretic, diminishing the quantity of albumin in the urine

<sup>1</sup> Brit. Med. Journ., vol. i, for 1895, page 1089.

and frequently causing oedema to disappear entirely. The formula employed is :

Lithium bromide,	1.25 to 2 grammes	(about 19.2 to 31 grains)
Sodium bicarbonate,	4       “	(       “       61.7       “ )
Distilled water,	240     “	(       “       8 f $\frac{7}{8}$ “ )

Peppermint oil (for flavouring), 2 drops.

Three or four tablespoonfuls were ordered in the twenty-four hours.

*Bromoform* is now being used more generally in pertussis. This application of it far exceeds any of its other uses. Dr. Max Stoss, of Vienna, Austria, and many others in the old country have employed it extensively in this affection. They report that the paroxysms are decidedly decreased in number and in most cases their intensity as well. In this country, among many others now using it to good effect, Dr. P. J. Eaton, of Pittsburg, Penn., and Dr. Herbert B. Carpenter, of Philadelphia, Penn., are about the most recent to report. Dr. Eaton read a paper on May 9 last, at the annual meeting of the American Medical Association in Baltimore, Md. He classed this agent as a sedative, germicide, and antipyretic and enumerated his cases of pertussis, where the control of the affection was marked and the mortality lowered. He as well as Dr. Carpenter recommends its use in alcoholic solution.

Dr. Carpenter's use of it in these cases was alluded to here last year, and now he reports on its use in quite a number of additional cases, "usually with most marked improvement in the condition of the patient. In some instances the disease was influenced in a very favourable manner, the paroxysms being greatly reduced both in frequency and intensity, showing that the drug was capable of exerting a very powerful influence upon the course and duration of the disease. As I said at that time, the good effect is partly, at least, due to its acting as a local anaesthetic upon the pharyngo-laryngeal mucous membrane. As a rule, I begin the treatment with two-drop doses every four hours, to a child of two years, increasing this somewhat if necessary. Bad effects are never seen from small doses and large ones rarely produce narcosis. As a rule bromoform will stop the vomiting within a few hours, and I have known it to relieve children who were rapidly losing ground on account of their inability to retain sufficient food to nourish them, and to relieve them to such an extent that they promptly regained strength. In a few instances it has checked the disease while in the full vigour of the paroxysmal stage. The duration of the treatment was from two to four weeks. The drug must not be stopped

too soon, as a relapse might occur. About 75 per cent. of the cases recovered within one to three weeks. I do not claim bromoform to be a specific, but I believe it will give better results than any other treatment we know of to-day for this dangerous and distressing disease. After the paroxysms have diminished a change of air, especially sea-air, is most beneficial ; in some cases often acting like 'magic.'"<sup>1</sup>

Dr. K. Stepp, of Nuremburg, Germany, reports excellent results in combating such pulmonary affections in adults as pulmonary tuberculosis, fibrinous pneumonia, and asthma in emphysematous subjects, together with broncho-pneumonia in children. It is claimed that the beneficial effects of this agent are produced by its elimination through the respiratory organs, thus coming into immediate contact with the affected parts.

*Calcium Sulphide* still receives attention from a few practitioners, but little appears in the medical literature. The most important article noted is one on "Sulphide of Calcium as a Prophylactic of Influenza," by Mr. W. E. Green, M. R. C. S., surgeon to the Isle of Wight railway. He writes as follows :

"Dr. J. Sinclair Coghill has contributed a valuable paper on the prophylaxis of influenza, by means of a large daily dose of quinine, which is undoubtedly one of the most valuable methods of treatment, but knowing that it is not every one who can take quinine, I resolved, when the first epidemic visited us, to try a daily dose of one grain of sulphide of calcium. All my household took it, with the exception of two servants, who for some reason or other did not, the result being that all escaped but those two exceptions.

"The next year, when the epidemic again broke out, I asked the authorities of the Isle of Wight railway to supply all their employees with the pills, and all who took them regularly escaped. The manager of the Central railway also asked me to supply his men with them, and he afterward informed me that, as far as he could ascertain, none of the men who had taken the pills regularly had had influenza.

"During the next outbreak, the pills were again given with like results, but on the Isle of Wight railway they were not given out to each workman as formerly, consequently but few took them, and the result was that a large number of influenza cases occurred among those who had not used the remedy.

"During this epidemic I also had an attack from having neg-

<sup>1</sup> Phila. Polyclinic, vol. iv, page 375.

lected to take the medicine until a day or two after the symptoms appeared.

"I can certainly speak from much experience of the efficacy of this remedy, having ordered it to numerous patients with the most satisfactory results.

"It takes about three days before the system becomes sufficiently saturated with the drug to prevent infection, therefore it is rarely of use to those who have already been exposed to it, though even then it appears to modify the attack. When a case appears, I believe the five-grain dose of quinine to be more rapid in its action than the sulphide of calcium, and therefore safer to give, but should afterward carry on the effect with the sulphide of calcium, which I feel sure is equally efficacious, and much easier for many to take, as it never appears to disagree in any way, although continued regularly for many weeks.

"I had a case of influenza a few days ago in a patient who had been taking twelve grains of quinine regularly every day for some weeks, and I have also seen it occur in others who have been taking daily doses of simple sulphur, with the idea of preventing influenza. I believe its *modus operandi* to be that it renders the blood unfit to receive and support the influenza bacillus."<sup>1</sup>

*Chloralamid* (chloral formamide) continues to be largely used, but has not been commented upon to any extent in the medical literature during the year. The principal paper now appearing in full was read at the forty-fifth annual meeting of the American Medical Association in San Francisco, Cal., last year, by Dr. Charles C. Browning, of Highland, Cal., on "Some of the Uses of Chloralamid." He remarks:

"As compared with chloral hydrate, it may be said that chloral is more rapid and powerful in its action, and is to be preferred in cases attended by extreme degrees of pain or nervous excitement, notwithstanding its well-known disadvantages. Chloralamid is safer, less disagreeable to the taste, free from disturbance of the circulatory and digestive systems, and free from depressing after-effects. Sulphonal is followed by more languor and general depression."<sup>2</sup>

Dr. B. D. Evans, of the Morris Plains Hospital (Insane), Morristown, N. J., corroborates Dr. Browning's conclusion that chloralamid is not as reliable as a hypnotic as either trional or sulphonal, but in exceptional cases it is "attended with gratifying results."

<sup>1</sup> Brit. Med. Journ., vol. i, for 1895, p. 974.

<sup>2</sup> Journ. Amer. Med. Assoc., vol. xxiii, p. 632.



*Chloralose* (anhydro-gluco-chloral) is still very largely used. Its principal usefulness is found in its hypnotic effects, and it has even been recommended as a sedative. It has also been effectively used in delirium tremens. Its one principal defect is the toxic symptoms too frequently noticed. The dose has to be considerably varied according to each individual patient. Dr. Rendu has even found as small a dose as 250 milligrammes (about four grains) to produce alarming intoxication in a tuberculous patient. Other similar cases are now reported after such ordinary doses as 200 to 400 milligrammes (about three to six grains).

It has, however, evidently come to stay, but must be treated as all potent remedies, with care and judgment.

*Chlorobrom* (equal parts of chloralamid and potassium bromide) still continues to be reported as of marked value in insomnia generally, as a hypnotic in the insane and in sea-sickness, although in the latter class of cases there is still diversity of opinion. There are evidently an increasing number of observers studying its effects.

*Chlorolin* is the name given to a general antiseptic and disinfectant solution reported to consist of the mono- and tri-chlor-phenols. Its mode of preparation and chemical properties are not given, but it is claimed to be efficient in solutions of  $\frac{1}{2}$  to 5 per cent.

Practically nothing is reported upon it except by the introducer, Mr. J. Weirich, of Strasburg, Germany.

*Chlor-Phenols* (mono- and para-chlor-phenol)—derivatives of carbolic acid—are still used as antiseptics, but not much has appeared in the medical literature concerning them, during the year. The former has been successfully used in this country in tubercular laryngitis, the latter by Dr. C. Girard, of Berne, Switzerland, as a general antiseptic in surgical operations. He finds that a dressing, for instance, well saturated with a 1 per cent. solution retains its antiseptic properties much longer than a 1 to 1000 corrosive sublimate solution. Operating instruments also stand this solution well.

*Chlor-Salol* is a new antiseptic analogous to chlor-phenol, but in place of carbolic, salicylic is the combining acid. It is reported to exist in the same two para- and ortho-modifications as chlor-phenol, differing from each other, however, in one decided way. They are both fine, colourless crystals, insoluble in water, but the para is practically odourless and tasteless, while the ortho has a very decided odour.

Dr. C. Girard, of Berne, Switzerland, has used it successfully, both internally and externally. Internally, two to four grammes,

(thirty-one to sixty-two grains) in catarrhal affections of the urinary tract, and in diarrhoea, have given satisfaction. Externally, ulcers and sores of various kinds treated by insufflation show rapid improvement.

*ChroatoI* is the odd name given to a new, oily, greenish-brown liquid, which appeals to the dermatologists for favour in the treatment of psoriasis and eczema. It is claimed to be prepared by the reaction between turpentine and iodine.

Mons. H. Fournier has used it incorporated with collodion in the proportion of 1 to 3. He reports that it does not irritate the skin, nor is it found to show any toxic symptoms. It is a competitor of gallanol. Little is generally known about it as yet.

*Citrophen* is the name given to phenetidin citrate, prepared by a patented process of Dr. J. Roos. Its composition is analogous to phenacetin (para-acet-phenetidin). The latter requires one molecule to saturate, for acetic acid is a monobasic acid, whereas citric acid being a tribasic acid, three molecules of phenetidin are required. It occurs as a colourless powder or crystals with the characteristic citric acid taste, and freely soluble in water—advantages over phenacetin and lactophenin. It may therefore be readily given hypodermically as well as by the mouth. Dr. Benario, of Frankfurt-on-the-Main, Germany, who has made successful use of it as an antipyretic and analgesic in typhoid fever, migraine, and various forms of neuralgia, reports that it is free from toxic properties and has been given in as large amount as 6 grammes (about 93 grains), in 24 hours. The recommended dose, however, varies from 500 milligrammes (about 7.7 grains) to 1 gramme (about 15 grains.)

*Creolin* (liquor antisepticus)—1 part resin soap and 2 parts crude carbolic acid, 20 per cent.—cannot yet supplant any of the well-known disinfectants, and nothing has appeared during the year to much encourage any surgeon in making use of it.

*Creosol* is a compound made up of the constituent phenols of beechwood creosote and about 40 per cent. of tannic acid. It is seen in the form of a dark brown, slightly astringent, amorphous powder, soluble in most of the ordinary solvents except ether.

It is recommended to be given in the powder form, or in solution applied to the mucous membrane in inflammations of the larynx and neighbouring parts, 3 grammes (about 46 grains) is sufficient for an initial dose. More definite clinical results are yet to come.

*Creosotal* (so-called creosote carbonate) continues to receive attention, principally, however, in Europe. There evidently it still

accomplishes much better results than beechwood creosote in pulmonary tuberculosis.

Dr. Edmond Chaumier, of Tours, France, reports good results in cases of aphthae, in which he paints the mucous membrane five or six times a day. Painting the crusts in impetigo with this agent has also given satisfaction. Dr. Chaumier is very enthusiastic about this agent, for he again brings it before the last International Medical congress, held in Rome, Italy. The discussion which followed brought out further adherents.

In this country an increasing number of observers have made successful use of it, and no doubt much good is accomplished.

*Creosote* still continues to be used, and no doubt will continue to be used, largely in dressing wounds, and in the treatment of pulmonary tuberculosis.

It has recently been recommended by Dr. Alvin H. Kerr, of Pittsburg, Penn., to kill the "pneumonia bacilli," claiming with emphasis that it is the nearest approach to a specific in the treatment of pneumonia that has yet been reached.

The most recent recommendation is in the treatment of scrofulosis by Dr. A. Eck, of Soumy, Russia. He reports having treated "all scrofulous children under his care, and always with the most excellent results." He "has found that this remedy may be administered without inconvenience, and even successfully, to infants of the tenderest age. After seven years of age he prescribes pure creosote; but for younger children he resorts to a mixture, composed of one part of creosote, to which are added five parts of tincture of gentian up to one year, four parts between one and two years, three parts between two and four years, two parts between four and six years, and one part between six and seven years of age. The creosote, whether pure or diluted, is first given at the rate of one drop daily, this dose being increased by one drop every three or four days, until at the end of about three weeks a maximum, varying between six and fifteen drops of the mixture of creosote and tincture of gentian, and between seven and fourteen drops of pure creosote, according to the age of the child, has been reached. This maximum daily dose should be continued without interruption for from two to four months, after which the number of drops is progressively reduced in an inverse ratio, until the treatment finally ceases altogether.

"The best method of administering creosote is to give it in milk, a quarter of an hour after a meal. Children take the medicament without reluctance, and even eagerly. Should, however, a case

occur, in which the child is reluctant to take the creosote in this manner, it may be mixed with a little honey and washed down with a few sips of milk.

"The effects of the creosote upon scrofulous children are first manifested by the cessation of dyspeptic troubles and improved appetite. Then the glandular swelling and chronic blepharitis disappears, and when affections of the bones and joints exist, even these are seen to be favourably influenced by the remedy.

"Judging from Dr. Eck's experience creosote has also the effect of rendering the complexion clearer, or at least causing freckles to disappear, and this not only in scrofulous children, but also in adults, even those who show no trace of scrofula."<sup>1</sup>

Rectal administration is still receiving attention.

"For creosote enemata an emulsion is usually employed, which is prepared with olive oil and the yolk of an egg. This emulsion, however, presents the disadvantage of being very unstable, besides being rather expensive, and on this account a recent announcement by Dr. Annequin, head physician to the Military Hospital of Grenoble, possesses considerable interest for the medical profession. He has found that milk is an excellent means of obtaining a natural emulsion, so to speak, of creosote, this preparation being of unlimited stability and unchangeable even by the addition of a large quantity of water. The idea of employing milk for creosote enemata was first suggested by Mr. P. Turchet, pharmaceutical *interne*.

"Such enemata are prepared at the hospital by adding to 30 or 60 grammes of a 5 per cent. solution of creosote in milk, a sufficient quantity of water to make 250 grammes of liquid. By simply shaking this mixture a perfectly homogeneous milk-white emulsion is obtained. In private practise a 1:30 solution of creosote in milk may be ordered, two tablespoonfuls to be used for an enema which is to contain 1 gramme of creosote. The enema may also be prepared by pouring 43 drops, equal to 1 gramme of creosote, into a quarter of a tumblerful of milk, then shaking it and filling the tumbler with water. In case the enema is to contain an opiate, it is preferable to employ tincture of opium, instead of laudanum, which, on account of its acid reaction, might determine the formation of a slight coagulum. At any rate, if it seems to be unavoidable to use laudanum, this substance should not be added until at the last moment, when the enema is ready.

"Creosote enemata prepared with milk are well borne by the pa-

<sup>1</sup> The Medical Week, vol. ii, page 504.

tients, better, indeed, than emulsions made with oil and the yolk of an egg.

"Milk may also be employed for guaiacol enemata, which are prepared in the same manner as described above, keeping in mind, however, that 1 gramme of guaiacol is represented by 38 drops."<sup>1</sup>

Its administration in pill form has been on several occasions sharply condemned as being valueless, but Dr. G. van Nerom now recommends the following formula for dispensing such agents as creosote, guaiacol, and the like:

Creosote . . . . .	10 parts.
Powdered Castile Soap . . . . .	10 "
Powdered Liquorice . . . . .	5 "

Other ingredients may be added at the expense of the powdered liquorice.

*Dermatol* (bismuth subgallate) is still in dispute as to its astringent effects, but its antiseptic properties continue to be warmly proclaimed. Its haemostatic action is apparently very marked, even being superior, according to Dr. Hecht, of Benthén, Prussian Silesia, to ferric chloride. It is applicable in most cases of hæmorrhage. Dr. Hecht explains that this action is due to the gallic acid set free from splitting up in contact with alkaline secretions. The fact that it readily splits up would explain the toxic bismuth symptoms developed at times, as they are similar to those noticed when bismuth subnitrate is used.

Dr. Romeo Roselli recommends its use "in many forms of inflammation of the eye, causing effusions to be absorbed, and possessing an astringent, drying, and cicatrising action." He found it "very useful in simple keratitis without photophobia or marked conjunctival hyperæmia, in corneal ulcers (especially in those of a traumatic origin), and even in diphtheritic conjunctivitis, but it is of very little good in blepharitis or in granular lids."<sup>2</sup>

He alludes to a minor objection in its producing a temporary smarting and weeping, which, however, passed off in a few minutes.

*Diaphtherin* (oxy-chin-aseptol), the antiseptic and astringent agent of such reported promise, has received very little attention during the past year, except from its enterprising business promoters. It does not appear to have made a permanent place for itself among the surgeon's requisites.

*Diaphtol* (chin-aseptol) has not been heard of during the year past.

<sup>1</sup> The Medical Week, vol. iii, page 288.

<sup>2</sup> The London Lancet, vol. i, for 1895, p. 1452.



*Di-Iodoform* (carbon di-iodide) has received practically no attention whatever during the year just passed.

*Diuretin* (sodio-theobromine salicylate) still continues to be quite largely used, but very little has appeared upon it in the medical literature of the year. The most prominent investigations reported upon it are those of Professor Panowski, who has studied its action with the view of determining whether the renal activity or the vasomotor system was affected. Fifty cases were selected for critical investigation, with these results: A tonic action is exerted on the cardiac muscle, and the area of cardiac dullness diminishing even before any improvement of the oedema was noticeable. It thus resembles caffein in action, but was not found to be superior to digitalis. A decided increase of pressure was noticed in the vessels, which was regarded as attributable to a stimulation of the nerve centre. The diuresis was very marked, but Professor Panowski claimed this was the result of the increased pressure in the vasomotor system. He recommends it as a diuretic, in valvular lesions after digitalis has failed, when its effects may be very gratifying. Of greater moment was its action in affections of the cardiac muscle, where he has seen remarkable results after digitalis, camphor, and caffein had failed to give relief. Beneficial effects were not so marked in renal affections, but he claims it is to be preferred to digitalis when there is slowness of the pulse premonitory of uraemia. In the other oedematous conditions, he does not recommend it. He administers it either in powders of about one gramme (fifteen grains), four to six times daily, or in solution, when the effects may be looked for between the second and sixth day.

*Dulcin* (para-phenetol carbamide) has received little attention during the past year. Dr. C. Bechert has, however, experimented on its solubility in some of the oils. It apparently requires as much as 237 parts of castor-oil to dissolve it, when it imparts an agreeable, sweet taste. In cod-liver oil, it requires fully 296 parts, and some time elapses before the sweet taste develops. Thus its usefulness in these two very desirable places is not very encouraging. Apparently, the solubility is much promoted by the presence of free, fat acid.

*Ethyl Bromide* (hydrobromic ether) is still received with marked favour by surgeons for short minor operations, as they claim the already relatively small mortality is decreasing and the superiority of this anaesthetic for this class of cases deserves more consideration than some are disposed to give it. A pure article, of course,

is always insisted upon. It decomposes so readily that care must be taken in regard to this prerequisite.

*Eucalyptol* has now proper tests provided in the U. S. Pharmacopoeia, which it must stand for its purity.

As it is coming more largely into medical use every year, chiefly as an agreeable and effective antiseptic, its purity is of considerable importance; therefore, according to the reports during the year, manufacturers are striving to produce the pure article as economically as possible and with the largest yields.

*Euchlorine Solution* has been again resurrected from what was supposed to be a complete state of oblivion, and only goes to show that, possibly, many of the supposed discarded older agents are still doing good service, although not much talked about. It may be well to recall here that this solution as originally introduced by Davy is a mixture of chlorine and chlorine dioxide gases in water, of a more or less deep yellow colour according to the strength of the solution. The mixed gases are prepared by the action of hydrochloric acid on potassium chlorate and are very explosive. Comparative safety in this regard is obtained by being offered for use in the form of a solution.

Mr. Henry Taylor, of Guilford, England, has called attention to his successful use of this agent for the past twenty years in cases of diphtheria. He reminds the profession that it was first employed and recommended by Sir Thomas Watson, in the treatment of scarlatina anginosa. In removing the exudation of membrane on the fauces, he claims "a success nearly comparable to that obtained with antitoxin serum in the metropolitan hospitals. In fact, the only instances of its failures I can remember were complicated with laryngeal and tracheal effusions, or were primarily cases of membranous croup. It always appeared to me that this solution, which is a most powerful antiseptic, has both a topical and general effect in neutralising the diphtheric poison, as it not only hastens the detachment of membrane from the throat, but it appears to lessen the chances of secondary affections, whether in the form of paralysis or renal incompetence. But for these effects to be obtained it is necessary that the solution should be freely and frequently administered, so as to keep the fauces as nearly as possible aseptic. And with the same view I have always used sulphurous acid or solutions of carbolic acid, either as a spray or to swab the throat with. My estimate of the value of euchlorine in diphtheria is supported by the testimony of Mr. T. Schollick, who was for several years medical officer of the Isola-

tion hospital for this union, and who had opportunities of testing its effects during more than one severe epidemic of this disease. It may seem late to propose a remedy for diphtheria in the face of the remarkable results obtained by the use of antitoxin, which possesses the advantage of controlling the laryngeal and tracheal affections, so often a cause of fatality. But circumstance may even yet arise to render a substitute for the serum a not unwelcome addition to our resources."<sup>1</sup>

*Europhen* (iso-butyl-ortho-cresol iodide)—the iodoform substitute, containing 27.6 per cent. of iodine—continues to be largely used, and is much liked by surgeons, but few general remarks have appeared in the literature of the year.

*Exalgin* (methyl-acetanilid)—the analgesic—has received practically no attention in the medical literature of the year, except that of reports of unfortunate toxic symptoms, even when given in what would be generally considered moderate doses.

Dr. Dujardin-Beaumetz, in discussing one of these poisoning cases which was reported at the Paris Therapeutical Society, reminded his hearers that the toxic dose was determined with great difficulty, owing to its low degree of solubility—1 in 48. This objection was a customary one with all agents of this class, and was not peculiar to exalgin.

*Ferratin* (acid albuminate of iron) alluded to here last year as being of some promise in the treatment of anaemia in general, has received practically no attention in the medical literature of the year. Whether this is due to its being found of little value, or to the fact that forthcoming reports are yet incomplete, remains to be seen as time passes. It is a patented article, and therefore receives relatively little attention in this country for that reason alone.

*Ferripyrin* (ferropyrin) is the compounded name given to a new haemostatic obtained by Dr. Witkowsky, of Frankfort-on-the-Main, Germany. It apparently is a true chemical compound of one molecule of ferric chloride, and three molecules of antipyrin. By calculation, this gives 64 per cent. antipyrin, 24 per cent. chlorine, and 12 per cent. iron. It is a bright, reddish-orange coloured powder, readily soluble in cold water, giving a blood-red solution, which is slightly astringent, but in no way caustic. Its taste is not disagreeable. It mixes perfectly with hydrochloric acid, pepsin, potassium bromide, and all tinctures free from tannic acid. It is not only applicable and efficient externally, but also internally in chlorosis, anaemia, etc. From the above description, it will be

<sup>1</sup>The London Lancet, vol. i, for 1895, p. 445.

seen how it possesses several advantages over ferric chloride, aside from its reported superior haemostatic properties. It has been used both in the powder form and in 20 per cent. solution, in all cases where the ordinary haemostatics are applicable. Its internal dose is from 200 to 600 milligrammes (about three to nine grains). Dr. A. Jurasz, and his assistant, Dr. L. Hedderich, of Heidelberg, Germany, have reported marked success in cases of nasal haemorrhages, using either the powder, by insufflation, or the 20 per cent. solution on tampons. In gonorrhoea, however, the urethral injections were not stronger than a  $1\frac{1}{2}$  per cent. solution.

It is recommended also in gastric haemorrhages and ulcerations of the stomach in nearer the maximum dose—500 milligrammes (7.7 grains), with a little sugar, or peppermint oil. In dental haemorrhages, Mr. D. Frohmann, of Berlin, Prussia, has met with excellent results by introducing it into the alveolus after the tooth has been extracted. It not only rapidly checks the flow of blood, but it allays the pain following the extraction, by virtue of its analgesic properties.

Dr. W. Cubasch, of Stanzstad, Switzerland, reports his successful application in a number of cases, and recommends preferable formulae for each class of cases :

In simple chlorosis, he employs

Ferripyrin . . . . .	0.600 grammes	(about $9\frac{1}{2}$ grains)
Orange Syrup . . . . .	20.000    “	(    “    5 $\frac{3}{4}$ )
Distilled Water . . . . .	180.000    “	(    “    6 f $\frac{3}{4}$ )

giving one tablespoonful three times a day.

In dyspepsia complications, he employs

Ferripyrin . . . . .	0.600 grammes	(about $9\frac{1}{2}$ grains)
Diluted Hydrochloric Acid	0.300    “	(    “    5 minims)
Pepsin . . . . .	5.000    “	(    “    80 grains)
Distilled Water . . . . .	200.000    “	(    “    6 $\frac{1}{2}$ f $\frac{3}{4}$ )

giving one tablespoonful after each meal.

In palpitation complications, he uses tincture of valerian and distilled water in conjunction with this agent.

In various forms of enteritis, he makes good use of either tincture of opium, or tincture of calumba, as adjuvants.

No doubt more will be heard of this apparently efficient agent as it becomes more generally known.

*Formalin* (forty per cent. solution of formaldehyde) has come to be quite a valuable agent, as an antiseptic and deodoriser, aside



from an increasing value in technical uses. It has now been abundantly proven that it is far more efficient, and in much less quantities than corrosive sublimate, borax, boric acid, salicylic acid, and benzoic acid. Although chlorine is still acknowledged as the best known disinfectant, yet it does not always give satisfactory results, often chiefly due to the lack of the necessary moisture to produce the proper results. Dry chlorine gas is inefficient. In the case of formalin (formaldehyde in the form of vapour) no moisture is called for, and quite as efficient results are obtained as with chlorine in such places as the sick room and hospital ward. Some observers claim its superiority over chlorine. An additional advantage possessed by formalin, is that it does not destroy the contents of the dwelling room.

Quite recently this agent has been effectively used as a preservative of foods (meats and vegetables). It is claimed that a one to two per cent. solution preserves fruit and vegetables not only in the ordinary sense, but in some cases does not destroy their fresh appearance.

The preservation of milk has been attempted with it, and with some good results, but there is still some dispute as to both the propriety and efficiency of this use.

The fact, however, has been made good use of by Mr. E. M. Holmes, of England, in preserving museum specimens.

As a hardening agent it has been found to be excellent, both in the old country as well as in this. Mr. Marshall, of England, read a paper before the Ophthalmological Society of the United Kingdom, at the meeting on December 13, last, on this property, and in this country Dr. Thomas S. Cullen, M. B., of Johns Hopkins Hospital, Baltimore, Md., has made some important observations on its use in furnishing "A Rapid Method of Making Permanent Specimens from Frozen Sections." He writes as follows :

"Anyone who has hardened tissues in formalin will be impressed with the rapidity of its action, with the firm consistence of the tissue, and with the absence of the contraction of the specimen so often seen when alcohol is used as the hardening medium. Microscopical examination of a specimen hardened in formalin, as we all know, shows almost perfect preservation of the cellular structure. Recently it occurred to me that formalin might be used in the preparation of frozen sections.

"One of the greatest difficulties experienced in rendering frozen sections permanent, lies in the fact that when passed through alco-



hol the section frequently not only contracts, but contracts irregularly, distorting the specimen ; further, such specimens will often stain imperfectly. The use of formalin will obviate these difficulties, allowing one to make an excellent permanent specimen from the frozen section."<sup>1</sup>

This agent evidently has a future before it, and more is being written upon its use each year.

*Frangula* (buckthorn) U. S. P.—*rhamnus frangula*—is not as generally appreciated as it should be, owing no doubt to the widespread advertising of its rival, *rhamnus purshiana* (*cascara sagrada*), which the former does not receive.

Numerous formulæ and expedients to make the latter attractive and palatable as a medicament, tend naturally to increase its use, therefore it may be useful, at this time, to repeat the very effective and pleasant form of administering *frangula*, published as long ago as 1888, by Dr. Alexander Hutchins, of Brooklyn, N. Y. Dr. Hutchins published a paper on "*Rhamnus as an Alterative*," in which he recommended the following formula for prescribing buckthorn as having given admirable results in his practise, and as having some decided advantages over a similar prescription made up with *cascara* :

"A mixture of equal parts of *rhamnus*, glycerin, syrup of ginger, and peppermint water represents  $\times 4$  to each  $\mathfrak{z}$  j. This is capable of being adapted in size and frequency, easily, to every age, sex, colour, and condition of life. In general,  $\mathfrak{z}$  j after each meal until more effect is produced than required ; then check off the noonday meal, later the morning meal, then continue with such diminished doses as will insure the desired result, and continue with the minimum dose so long as may be useful."<sup>2</sup>

His careful deductive method by which he attempts to decide the question on its merits, and obtain his final conclusion, will be of value to those who are interested in true therapeutic results. Judging from the continued favourable reports from certain sections where this agent rather than *cascara* has been used, complete confirmation of Dr. Hutchins's results has surely been established.

*Gallanol*—the analide of gallic acid—has been little heard of during the year just past. What little has appeared in print has been less pronounced in its favour. Its freedom from staining

<sup>1</sup> His explanation of his methods will be of interest to those who have occasion to do this work, and will be found in the *Johns Hopkins Hospital Bulletin*, vol. vi, page 67.

<sup>2</sup> The Brooklyn Medical Journ., vol. i, p. 119.

still stands to support its use, but the dermatologists generally rather incline to its stronger rival, chrysophanic acid, even with its undesirable peculiarity.

*Gallicin* is the name given to the methylic ether of gallic acid. It is prepared by the patented process of a manufacturing firm in Basle, Germany, by dissolving gallic acid in methylic alcohol, and then heating the solution with sulphuric acid under certain conditions to produce the ether. When purified by re-crystallisation, it forms either fine, colourless rhombic crystals, or fine, snow-white, silky needles, depending upon whether methylic alcohol or water is the solvent. The latter form is apparently preferred. It is soluble in hot water, and crystallises out when cold. Chemically, it is quite analogous to resorcin and pyrogallol, and its uses are the same. It, however, is not poisonous.

Its use has been confined, practically, to hospital service. Under the direction of Dr. H. Schiess, of Basle, Germany, Dr. Carl Melinger made good use of it in his wards in 200 cases of follicular or catarrhal conjunctivitis, with consecutive eczema of the eyelids, phlyctenular conjunctivitis, and keratitis, superficial keratitis and suppurations of different kinds. It is applied like calomel in such cases on a camel's-hair brush into the oculo-palpebral fold, and on to the patches in the powder form. The applications were made generally twice a day, and usually followed by smarting, which soon passed away after cold compresses were applied. Dr. Melinger prefers this agent in these cases to either dermatol or gallanol, and in cases where there is hyper-secretion, it is far preferable to calomel, as there he claims the latter is contra-indicated. It is too new an agent to expect any reports from this country as yet.

*Guaiacol*, obtained from beechwood and other creosotes, has varied so considerably in purity—all the way from 50 to 90 per cent.—that a strong incentive has been given to perfect the previously discovered process for making a synthetic product. It has at last been accomplished, and an article which is claimed to be absolutely pure is being made on a commercial scale. It is now such an important article to the medical practitioner, that it becomes a serious question to obtain a reliable article.

The literature on this agent has been voluminous throughout the year. Its external application in acute pulmonary tuberculosis and as an antipyretic in typhoid fever, and in other fevers, has received very marked attention. Its application as a local anaesthetic has been largely pushed, with much benefit. Some claim that it is as powerful as cocaine, and much safer, as it can be given in ten

times as large doses without ill effects. Dental surgeons are extolling it, for perfect analgesia is obtained when injected before extraction of a tooth. In conjunction with menthol, it is of pronounced service as a local treatment of neuralgic pains. In conjunction with glycerin and tincture of iodine, it may be successfully applied over the whole posterior portion of the thorax in pleuritic effusions.

Dr. E. Darbouet, of Boucau, France, has met with success in treating non-diphtheritic sore throats by applying this agent in glycerin. He finds that the most intense sore throats run their course without fever or pain. The general condition of the patients remains good throughout the whole course.

It has found increasing use in this country as well as abroad.

*Hydrogen Dioxide Solution* (peroxide of hydrogen solution) has now found a permanent place in the list of physicians' medicinal agents; and even new uses are being repeatedly found—gonorrhoea in males being one of the latest.

From time to time assays of the products found in the market are made public, and criticism is made upon them according to results. It may be well here to remind observers that the criticism of over-acidity is not always just, and should be carefully considered before offered, for, after consideration, it will be seen that such acidity may be rather advantageous than otherwise. When the acidity is due to sulphuric or phosphoric acid, present there on account of careless manipulation by the manufacturer—particularly from incomplete washing—harm is done whenever the solution is used, but again it must be remembered that many of the manufacturers protect the solution against rapid decomposition by the addition of one per cent. of "boroglyceride," and this reacts as free boric acid when tested with normal soda solution. This boric acid is not an irritant to mucous surfaces, but is an active antiseptic and bactericide, and was selected for protecting this solution from decomposition for the very reason that it was non-irritant, medicinal, and remedial in exactly the same way as the solution of hydrogen dioxide itself.

*Ichthyol* (ammonium ichthyol-sulphonate) has apparently received the confidence of a large proportion of the medical specialists, especially the dermatologists. The reports are now numerous of successful cases when used externally. The success of its internal use is not so positively stated, although many firmly believe in its great benefits. Chief among its successful uses, during the past year, is in the treatment of pulmonary tuberculosis.

Dr. L. Guido Scarpa, of Turin, Italy, reported his successful results to the meeting of the Royal Academy of his city on March 8, last, in 150 cases of this affection, occurring between the months of April, 1894, and January, 1895. He pointed out that from what was known of the action of ichthyol as an astringent of the vascular system, as an antiseptic, and as a disinfectant of the digestive apparatus, it was *a priori* presumable that it would be useful in pulmonary tuberculosis. He employed the purest he could obtain, dissolved in two thirds of distilled water or other suitable vehicle. Of this solution he gave from 20 to 180 or 200 drops, dissolved in water, in the course of the day. It was in all cases well borne. No other treatment was employed beyond attention to the hygienic environment and feeding up. Of the 150 cases, 23 died; all these were in a desperate condition before the treatment was begun, but even in them the ichthyol appeared to be of service. Of the remaining cases 17 were apparently cured; in 50 there was notable improvement; in 32 there was some improvement; in 28, up to the date of report, the treatment had produced no effect. The good effect of the ichthyol shows itself first in the influence which it has on the symptoms produced by the local lesions—cough, expectoration, dyspnoea—afterward on the general condition. Physical examination showed profound modifications in the lesions, especially in the circumscribed infiltrations of the early stage, but also not infrequently in those of the breaking down stage. Dr. Scarpa does not attempt to decide whether the ichthyol acts only by improving nutrition, or also by direct action on the lesions, or again, by neutralising the toxins produced by micro-organisms, both Koch's bacillus and the staphylococci, etc., which are the causes of secondary infections. He insists on the advantages which ichthyol presents over guaiacol in the treatment of tuberculosis.

*Iodoform* is still a most important agent in the surgeon's hands. Notwithstanding the numerous substitutes, with all their claims, he finds he cannot do without it, in spite of its disagreeable odour. This latter objection continues to receive attention. It is now affirmed that the application of oil of turpentine to the part on which iodoform has been applied will completely mask the characteristic odour. In cleaning the hands, for instance, a little oil of turpentine is added to the wash water and the hands well wetted with this. Then, after washing with soap and water, the odour completely disappears.

Another suggestion, based on actual experience, comes from



Surgeon-Captain J. S. Edye, A. M. S., of Aldershot, Eng., who reports on a case where equal quantities of freshly ground coffee and iodoform, mixed, did away with the odour of the latter and apparently in no way affected its medicinal properties.

*Iodol* (tetra-iodo-pyrrol)—the iodoform substitute—still seems to find favour with a few surgeons. Its general dermatological use has been previously recorded, but now it is reported that after some years' experience it is found to give the best results in the special use of treating aural eczema. The thoroughly cleansed part is dusted with the powder and, if the auditory canal is affected, the whole calibre is filled up with it.

*Izal*, the patented antiseptic, continues to be used to some extent chiefly in Great Britain, however. It being a patented article, detracts from its use in this country. It has no disagreeable odour, is a non-irritant, and does not affect the surgeon's instruments. It makes a cloudy solution, which is objected to by some, but this peculiarity will distinguish it from pure water or other clear solution around the surgeon's operating table.

Mr. Sheridan Delépine, professor of Pathology in Victoria University, England, has probably made the most careful recent study of the year on its disinfecting and antiseptic properties. His report comes from the Bacteriological laboratory of Owens College, as follows :

"Among the numerous products which have, of late years, been proposed as advantageous substitutes for some of the older disinfectants and antiseptics, izal is undoubtedly one of those deserving very special attention. Observations made by Dr. Klein nearly three years since have shown it to be capable of killing a large number of micro-organisms associated with various diseases, and this it could do even when sufficiently diluted as to cause no detrimental irritation of tissues.

"Among the most remarkable features of this compound are its comparative insolubility and non-volatility at the ordinary temperature, properties which it seems difficult to associate with an active disinfectant, but which numerous experiments have proved not to be incompatible in this case. If we add to these the facts that izal can be freely administered internally, used over extensive wounds, or injected under the skin without bad effects, and, finally, that it does not damage surgical instruments, there are sufficient grounds to justify the impression that izal is a substance of considerable scientific and practical interest.

"In the course of numerous experiments on well-known disin-



fectants, I have come to the conclusion that it is difficult to compare the results obtained by various observers owing to the different conditions under which they conduct their observations, and also because the micro-organisms which they use for the purpose of testing the germicidal properties of various substances differ in their degree of resistance according to the way in which they have been cultivated, kept prepared for experiments, etc. Though accepting fully the results obtained by Dr. Klein and other observers I, at the suggestion of Mr. J. H. Worrall, thought it might be well to test again the germicidal properties of izal. I naturally avoided conducting my experiments on the same lines as those fully explained in Dr. Klein's report.

"As it was my intention to study carefully the effects which certain disturbing factors might have on the results obtained, I investigated the action of izal on a small number of germs. I selected them so as to get types of the most important forms of pathogenic bacteria which one might have to deal with in practise. These organisms were :—(1) The bacillus tuberculosis (hominis); (2) the bacillus coli communis (which I preferred to the bacillus of typhoid fever for reasons given further on); (3) the staphylococcus pyogenes aureus; (4) the bacillus anthracis (in the sporing stage). In the course of the last seven months I have conducted, with the valuable assistance of Dr. F. Coutts, over one hundred and fifteen experiments with these four microbes, paying special attention to the conditions of growth, temperature, dryness, age of germs, etc., etc., which might be expected under ordinary circumstances to influence the resistance of bacteria or the activity of any disinfectant. A careful record of each experiment has been kept."

He next adds a summary of his results and concludes :

"Summing up the results of the experiments just recorded I think that izal diluted with 100 or even 200 parts of water is a powerful and reliable antiseptic when contact of a sufficient length of time is secured. As an antiseptic it is more powerful than carbolic acid, and, if it be remembered that it causes very little irritation of living tissues, that in moderate doses it is not poisonous, and that, practically speaking, it is not volatile, there can be little doubt as to the immense advantages which izal possesses over carbolic acid in many directions."<sup>1</sup>

*Lactol* (lacto-naphtol)—the intestinal antiseptic, analogous to benzo-naphtol—has not been reported on during the past year.

<sup>1</sup> The Medical Chronicle, of Manchester, Eng., vol. iii, p. 434.

*Lactophenin* is still thought considerably of by many practitioners. Such observers as Drs. Stein and H. Strauss, of Germany, have now emphasised its antipyretic action, and even claimed its superiority over antipyrin. It has hitherto been used chiefly as an antipyretic, antineuralgic, and hypnotic, but Dr. von Roth now calls attention to its beneficial action in a small number (28) of cases of acute rheumatism where the salicylates, antipyrin, acetanilid, and sulphonal have either failed or been contra-indicated. His doses varied all the way from one to six grammes (15.4 to 92.6 grains). He concludes: "That both the pain and the swelling disappear as a rule in from twenty-four to forty-eight hours; that the temperature keeps low, and that notwithstanding large doses unpleasant after-effects were not noticed. He finds this agent of use also in chorea and locomotor ataxia. He believes lactophenin is of sufficient value to be classed with the salicylates as an anti-rheumatic.

*Loretin* (meta-iod-ortho-oxy-chinolin-ana-sulphonic acid)—the iodoform substitute—is still on the market, but it apparently has not been as prominent as its promoters had looked for. Its claims over iodoform of being without odour, of having neither local nor general toxic effects, and of being cheaper, have apparently been verified, but still its use evidently drags and little has been heard of it in this country.

*Losophan* (tri-iodo-meta-cresol)—the antiseptic containing about 80 per cent. of iodine—has been little heard of during the past year, and that little has been rather against it. Dr. Abbott Cantrell, of Philadelphia, Penn., after a year's use, thinks that it is a waste of time to make use of it in skin diseases whatever else it may be used for. In his dermatological practise it proved entirely inefficacious in almost every skin disease. After a two months' treatment of one single case of tinea sycosis he apparently secured what might be called a cure, but in acne only slight benefit was derived. The future of this agent is evidently not very promising.

*Lycetol* (di-methyl-piperazin tartrate)—the uric acid solvent—is still in use, but to a comparatively limited extent. Nothing new can be reported upon it, as very little has appeared in print.

*Lysol* (the saponified product of coal-tar, chiefly composed of cresols)—the substitute offered for carbolic acid—is preferred by some surgeons, but little has been reported during the year except poison cases. This no doubt is unfortunate, for even though this agent may have marked advantages, such exclusively poor reports look badly.

*Lysidin* is the name now given by Professor Ladenburg, of Breslau, Prussia, to the identical compound ethylene-ethenyl-di-amine of A. W. Hoffmann, who first obtained it in 1888. Professor Ladenburg has now prepared it by his own method of dry distillation of sodium acetate and ethylene-di-amine hydrochlorate, and recommends it in cases of uric acid diathesis.

It is a very hygroscopic, pinkish-white crystalline substance, with a taste not disagreeable, but with the peculiar mousy odour of conium fruit. It is readily soluble in water, and is offered in the market in a strongly alkaline 50 per cent. solution. It is claimed to have five times the solvent power for uric acid that piperazin has.

Dr. E. Grawitz, of Berlin, Prussia, has obtained excellent results in two patients suffering from chronic gout, with exacerbations, in Dr. K. Gerhardt's wards. The dose given varied from two to ten grammes (30.9 to 154.3 grains) of the 50 per cent. solution in a glassful of aerated water. Although very complete observations of the food, urine, and faeces were carried out, no practical alteration in the uric acid excretion was noticed, therefore Dr. Grawitz concludes that only part of the uric acid dissolved from the tophi by this agent had been eliminated by the urine.

In a review of the subject of gout at this date, Dr. Archibald E. Garrod draws the following pertinent conclusions :

"In connection with the action of piperazin and lysidin, the observations of Martin Mendelsohn are of much interest. He shows that in the presence of urine, the solvent power of these drugs upon uric acid is abolished, and has been able to trace the inhibitive action to the sodium chloride present. He concludes that the drugs can have no power of dissolving renal or vesical concretions of uric acid. As regards gouty tophi the case is different; for, in serum, uric acid is dissolved by piperazin and lysidin nearly as well as in water. The clinical effect of lysidin in dissolving away tophi, which has been observed by Grawitz and others, and the similar and much longer known action of lithium compounds, are, however, as was long ago pointed out by Prof. A. W. Williamson, very hard to understand on chemical grounds. We must remember that tophi consist, not of free uric acid, but of sodium biurate, and it is difficult to see how the introduction into the blood of a metal or organic base, which forms a more soluble compound with uric acid, should bring about the dissociation of the components of the very insoluble sodium biurate."<sup>1</sup>

Dr. Grawitz has made use of lysidin in acute articular rheuma-

<sup>1</sup> The London Practitioner, vol. iv, p. 286.

tism, but with rather discouraging results. Antipyrin in these cases brought rapid recovery.

Nothing has been heard of this new agent in this country as yet.

*Malakin* (salicyl-para-phenetidin) is still little known in this country. Its use abroad, even, is not very general. The only English report of any prominence is that of Dr. Robert Abernethy, F. R. C. P. E., who made use of it "in a number of cases of pyrexia of rheumatic and other origin," and was "much struck with its good effects." He gives the details of one case in particular, "as it illustrates a troublesome condition occasionally met with in protracted cases of rheumatic fever." He then concludes :

"I was so convinced of the good effect of the drug in this case, after other antipyretics had failed, that I have given it since in a good many cases of pyrexia due to various causes ; among others, a case of rheumatic fever, with advanced mitral disease, in which it controlled the symptoms admirably, without, apparently, causing any considerable depression. Also in two cases of croupous pneumonia, in children of nine and eleven respectively, in which it seemed to have a beneficial effect, both making remarkably good and speedy recoveries. In short, such results as I have obtained so far encourage me to make a further trial of the drug, in those cases of pyrexia in which either the phenacetin or the salicylic group have been found useful, but especially the latter, as its use seems to be attended with a minimum of the bad effects sometimes seen under the administration of those drugs."<sup>1</sup>

On the continent, only one report of note occurs—that of Dr. Montagnon. He gives his successful experience in acute articular rheumatism.

*Mallein* is the name given to a culture of recent development, analogous to tuberculin. Dr. J. S. Ely, of New York city, in a periodical review of the current literature of pathology and bacteriology, reports as follows :

"Mallein has not as yet been obtained in a state of chemical purity, or even isolated, but is present in very various proportions in different culture fluids. Forth's mallein, which is ten times as strong as some samples, and the dose of which is but 0.01 gr., is thus prepared. The virulence of the bacilli of glanders having been greatly intensified by their being passed through a succession of guinea-pigs, cultures are made on potato, between watch glasses. When these have become perfectly black, they are put into flasks

<sup>1</sup>Edinburg Med. Journ., vol.xl, p. 692.



and just covered with a solution of equal parts of glycerin and distilled water, with 3 to 5 per cent. of sublimate, and kept for ten to fourteen days in a warm chamber, at a temperature of 37.5° C. (99.5 F.) The fluid is then strained through filtering paper, and sterilised by an hour's exposure to a steam current. The filtrate, a dichroic, *i. e.*, brown-green fluid, will remain sterile, and retain its activity for six months at least, though the bottle be opened frequently.

"The dose is 0.3 to 0.5 c. cm., diluted to 3 c. cms. with 5 per cent. phenol water. This mixture is very stable, and the mallein may with advantage be sent out in this form."<sup>1</sup>

He prefaces a relation of the reports of cases by Drs. Hutyra, Preisz, Schindelke, and others, as follows :

"Although the tuberculin of Koch failed to realise the expectations of those who hoped to find in it a cure for tuberculosis, there could be little doubt that the characteristic febrile reaction induced by it in tuberculous subjects only had a certain scientific, if not a very practical, value as a means of diagnosis. But no truth can long remain barren, and Kalning, following up the clue, succeeded in a few months in obtaining from artificial cultures, of intensified bacilli of glanders, a substance, which, acting in like manner, detects, with almost unerring certainty, the presence of that disease, even in those cases of chronic farcy, in which deep-seated glands only are implicated, and the general health of the animal is, apparently, unaffected. This reaction, which is independent of, and not obscured by, any pyrexia already present, whether due to the disease in question, or to concurrent febrile processes, is not manifested after injections of mallein in the course of any of those, as tuberculosis, glandular affections, lymphangiomata, sarcomata, catarrh of antrum, pneumonia, etc., which simulate either the acute or chronic forms of glanders or farcy. It is quite characteristic, commencing in four, six, or eight hours after the injection, culminating in ten, twelve, or fourteen, and subsiding between the sixteenth and twentieth, or in some cases not until twenty-four to thirty-six hours. The maximum temperature of 39.5°—40° C. (=95°—104° F.) once reached, is maintained, without oscillations, for from six to twelve to eighteen hours, but no rise of less than 1.5° C. (=2.7°F.) can be considered as more than ground for suspicion."<sup>2</sup>

No doubt more will be heard of this culture later.

<sup>1</sup> Amer. Journ. of the Med. Sciences, vol. cix, p. 233.

<sup>2</sup> Amer. Journ. of the Med. Sciences, vol. cix, p. 232.



*Menthol* calls for no special mention at this stage of its history, as it has become a well-established agent in the physician's hands. Reports continue to be made of its successful use in pulmonary tuberculosis.

The following formula is recommended to obtain a rapid local anaesthesia to last about five minutes :

Menthol . . . . .	2 grammes (about $\frac{1}{2}$ 3)
Chloroform . . . . .	20 " ( " 5 3)
Ether . . . . .	31 " ( " 1 $\frac{2}{3}$ )

To be applied by an ordinary hand spray.

*Methylene Blue* (tetra-methyl-thionine chloride)—the anilin derivative—continues to be claimed by a few observers of much benefit in cases of carcinomatous growths. Cases of definite cures (?) are still reported, but it is rare to hear of the subsequent history being followed up very closely.

The recent reports in the treatment of Asiatic cholera are not very encouraging. Out of 100 cases treated by Dr. Neufeld, of Siedlce, Russian Poland, 60 died. Those who recovered, did so within about six days.

At the eleventh annual meeting of the Fifth District Branch of this Association, held in Brooklyn on May 28, last, Dr. Austin Flint, of New York city, related "A Case of *Filaria Sanguinis Hominis*, with Chyluria, treated successfully with Methylene Blue," in which he states :

"Having had considerable experience in the use of methylene blue, in malarial disorders, and, in view of the action of this remedy on the *plasmodium malariae*, it occurred to me that it might have a similar effect upon the filaria. I accordingly suggested to Dr. Henry to give the patient two grains of methylene blue every four hours during the day, and to note the effect upon the patient, and upon the parasite." He then proceeds to relate the history of the cases referred to, and afterward comments as follows :

"Judging from this single case, it appears that methylene blue is a prompt and efficient remedy for chyluria dependent upon *Filaria sanguinis hominis*. In this instance more than a year has now elapsed, without a return of the disease. This single experience points to the possibility of benefit from methylene blue in the treatment of other diseases due to the filaria, such as chylous collections in the peritoneal cavity and in the cavity of the tunica vaginalis testis, haematuria, and elephantiasis.

"About two years ago I made an observation on a perfectly healthy subject on the effects of methylene blue on the urine. An hour and a half after taking a grain and a half of methylene blue the urine was distinctly coloured. In two hours and a half the urine was intensely blue. The methylene blue was continued, a grain and a half three times daily, for three days, and twice daily for four days, without the slightest inconvenience. It was discontinued at the end of the seventh day. The urine gradually lost its blue colour, but it did not disappear until about forty-eight hours after the last dose. During the administration of the drug the faeces were coloured blue.

"I have used methylene blue with success in malarial enlargement of the spleen, in chronic cystitis, and in a few cases of gonorrhoea. I have given it in doses of a grain and a half to two grains, in capsules, two or three times daily. In a few cases it has produced some irritation of the neck of the bladder, but this has been exceptional. It has been recommended to give about thirty grains of powdered nutmeg with each dose of methylene blue, to guard against bladder irritation. In cases in which any trouble of this kind has occurred I have corrected it easily with nutmeg. In malaria it has been found that methylene blue directly attacks the plasmodium and promptly relieves the symptoms in many cases, but the good effects are not so lasting as when the condition is overcome by quinine. This has been my experience; but in some cases of enlarged and painful spleen of malarial origin, which have resisted quinine, the methylene blue has acted promptly and most satisfactorily. Having used this remedy for seven or eight days, I have discontinued it and substituted quinine in moderate doses, and continued for several weeks, with excellent results.

"I give my experience with methylene blue in gonorrhoea with great diffidence, for the reason that my opportunities for testing it have been small, and the results in the hands of others to whom I have suggested its use have not been entirely satisfactory. My attention was directed to its use in gonorrhoea by an article by Dr. Max Einhorn, which appeared in the *Medical Record* for November 1, 1891. I was specially struck with the logic of this treatment for gonorrhoea, as both methyl blue and methylene blue are used largely in staining the gonococcus."<sup>1</sup>

On the other hand, Dr. Wm. J. Robinson, of New York city, most decidedly differs with Dr. Flint. After relating his experience, which he admits is not large, he claims that it has been suffi-

<sup>1</sup> N. Y. Med. Journal, vol. lxi, p. 737.

cient to convince him that this agent is not only utterly worthless, but positively injurious. His conclusions are as follows :

“If we see a case of specific urethritis in a very early stage—the first day—then the use of methylene blue, by its direct action on the gonococci, may do good, though we run the risk of strangury and general toxic manifestations. But as soon as the gonococci have penetrated beneath the epithelial layer of the urethral mucosa then methylene blue can do nothing or harm.

“I have used it in three cases of intermittent fever with fair results, but its action is certainly much inferior to that of quinine and arsenic. My general conclusions, therefore, coincide with that of Laveran, that used internally methylene blue is good only for one purpose—to colour the urine blue. It is an excellent colouring agent, though, for the plasmodia malariae and the gonococci Neisseri, and is useful when employed externally in cancerous and tuberculous affections. It is undoubtedly very pleasant to be in a position to report brilliant successes and cures from a new remedy, but it is certainly just as useful to show the reverse side of the medal, and thus save our fellow-practitioners many failures and our patients much unnecessary suffering.”<sup>1</sup>

This agent has had a comparatively limited use in this country.

*Migranin* (double citrate of antipyrin and caffen)—recommended for the treatment of sick headache and neuralgia—has not been favourably received even on its native soil, for a report is published that the police authorities of Hamburg, Germany, have issued a notice warning the public against using it except under a physician's direction. Its free sale has been forbidden in the local pharmacies.

Nothing has been reported upon it in this country.

*Naphtol* ( $\beta$ -Naphtol) calls for no special mention, particularly as it has now become a well-recognised antiseptic agent, especially in the intestinal tract, and officinal in most national pharmacopoeias. It is somewhat disagreeable to administer, particularly to children, but Dr. E. Embley, of West Melbourne, Australia, recommends the following emulsion which he extols as an effective and agreeable intestinal antiseptic in typhoid fever :

Olive Oil . . . . .	40.000 grammes (about 10 3)
Powdered Acacia sufficient to make an emulsion.	
Dissolve in the emulsion by heating.	
$\beta$ -Naphtol . . . . .	4.000 grammes (about 1 3)

<sup>1</sup> N. Y. Med. Journal, vol. lxii, p. 186.

Then add,—

Cassia Oil . . . . .	0.400 grammes (about 7 minims)
Glycerin . . . . .	30.000      “      ( “      1 $\frac{2}{3}$ )
Distilled Water . . . . .	175.000      “      ( “      5 $\frac{1}{2}$ $\frac{2}{3}$ )

One tablespoonful to be given every four hours.

Good results continue to be reported from several observers after the injection of camphorated naphtol (naphtol camphor) in tubercular peritonitis.

*Neurodin* (acetyl-para-oxy-phenyl-urethane)—the new anti-neuralgic and analgesic alluded to last year—is still before the medical profession and is being closely investigated. The most thorough study during the year has been made by Dr. Ugo Lippi, of Italy. His experiments were made on fourteen cases, and were classified as follows: (1) Experiments on patients not suffering from pain, made in order to determine the limits of tolerance of the drug, and the possible toxic effects which might be caused by it; (2) experiments on patients suffering from pain of various kinds, either in the form of essential neuralgia or that accompanying other morbid conditions.

Dr. Lippi then draws the following conclusions:

1. This agent may be given in doses varying from five hundred milligrammes to three grammes (7.7 to 46.3 grains), with good effect and may be repeated several times a day.

2. Such doses are harmless, and produce no more serious effect than occasional diarrhoea, with or without intestinal pain.

3. Practically no physiological effects were noted; in rare cases there was a slight diminution in the heart beats, but no marked effect on the kidneys was noticed.

4. Its analgesic action was found to be soothing, even abolishing pain, whether neuralgic in character or symptomatic of an organic affection.

5. Its action, however, is uncertain, and much inferior to that of remedies such as phenacetin and antipyrin. In addition it has the great disadvantage of not being readily soluble in most of the ordinary vehicles.

*Nitroglycerin* (glonoin, trinitrin) in the form of a one per cent. alcoholic solution is officinal in both the British and U. S. Pharmacopoeias, and has found an established use, therefore little comment is to be looked for here. However, Dr. P. M. Mikhailine, of Nijni-Novgorod, Russia, has recently found a new and successful use for it in sciatica. Its powerful anti-neuralgic properties were well exhibited in three cases which would not respond

to antipyrin, phenacetin, acetanilid, chloral, bromides, and other agents.

He is able to report two cures and one marked improvement.

He prefers the following mixture :

Alcoholic solution of trinitrin, 1 per cent.

		5.0 grammes (about 80 grains)	
Tincture of capsicum . . . . .	7.5	"	( " 120 " )
Peppermint water . . . . .	15.0	"	( " 240 " )

Five to ten drops to be taken three times a day.

*Nosophen* (tetra-iodo-phenol-phthalein) is, as might be inferred, an iodine compound. It is prepared by Drs. A. Classen and W. Löb by treating a solution of phenol-phthalein with iodine. It is a pale yellow, odourless, and tasteless powder, insoluble in water and acids, slightly so in alcohol but readily soluble in ether, chloroform, and the alkalies, and contains about 60 per cent. of iodine. It is an acid in its reaction, and forms salts with many of the ordinary bases. Its bismuth salt is known by the name "eudoxin," and the sodium salt by the name "antinosin." A series of experiments has already been carried on with this agent upon animals and man, both internally and hypodermically applied, and iodine has failed to show itself in the urine. In fact no toxic effects whatever were noted. Dr. Otto Seifert, of Würzburg, Bavaria, therefore undertook to make practical application of its marked desicating and antiseptic properties by insufflation in the treatment of acute coryza, chronic rhinitis with accompanying hypersecretion, balanitis, soft chancre and eczema, with considerable advantage in all cases.

Dr. Theodor Koll also reports favourable results in the same class of cases.

It is specially adapted, owing to its comparative insolubility and freedom from odour, to the after-treatment of operations on the nose by insufflation. It prevents suppuration and formation of adhesions after the application of the chemical or galvanic cautery. It causes no irritation and no secretion in rhinitis sicca. It diminishes the secretion and cures the inflammation quicker than bismuth, aristol, euophen, or sodium sozoiodolate in rhinitis hyper-secretoria. It apparently shortens the course of rhinitis acuta. In one case of nasal diphtheria where it was employed the membrane disappeared in four days.

In venereal diseases also it finds special application. Six cases of balanoposthitis were cured in three days. In cases of soft



chancre it was equal to euophen if the precaution was taken to first cauterise the sore in order to prevent it forming a crust and retaining the secretion. The number of cases of hard chancre treated was too small to form any definite opinion.

One case of weeping eczema of traumatic origin was cured in a remarkably short time.

Dr. A. Lieven, of Germany, first made use of the sodium salt (bluish in colour), giving it the name "antinosin," having found cases in which he desired a soluble salt, which this is. A one per cent. solution was found to prevent the further development of the anthrax bacillus, staphylococcus pyogenes aureus and the diphtheria bacillus within an hour, and has been used in this strength and over by Prof. K. Posner, of Berlin, Germany, and others, in irrigating the bladder in cystitis. The beneficial effect, however, was not uniformly good, for in some cases it was not well borne.

"Eudoxin"—the bismuth salt—has been used with some good effect by Dr. Theodor Rosenheim, of Germany, in twenty-six cases of intestinal catarrh, principally chronic. He attributes the good results largely to its antifermentative action and its freedom from deranging the stomach, even in dyspeptics.

This new agent has not been used in this country as yet.

*Paraldehyde* has now an established reputation among practitioners generally, which is strengthened by the following report by Dr. B. D. Evans, on the therapeutics of the prominent drugs used in the Morris Plains Hospital (Insane), Morristown, N. J., during the last year :

"After several years' trial this drug has established itself as a valuable and reliable hypnotic, to which, however, there are two serious objections : first, that it gives to patients when swallowing it the sensation of smothering or strangling, and second, its slow elimination through the lungs, leaving some patients drowsy and all patients with its strong odour for six or eight hours after its sleep-producing effects have passed away, but withal it may be relied upon to give to a case of almost any form of insomnia from four to six hours of refreshing sleep, when administered in doses of from one to two fluid drachms, mixed in equal parts of sp. frumenti and syr. aurentii. In the sleeplessness of chronic alcoholism, alcoholic mania, delirium tremens, and of chronic "disturbances" this drug has no superior as a hypnotic. In many of the acute forms of insanity it acts very gratefully, but occasionally it fails. It does not disturb the appetite, and does not depress the heart's action."

*Pental* (tri-methyl-ethylene)—the anaesthetic for minor operations—has not been reported on during the year.

*Phenacetin* (para-acet-phenetidin) has been repeatedly claimed as producing no ill effects. This is comparatively true only, for much dissatisfaction has been expressed by some observers. A "Study in Therapeutics"<sup>1</sup> expresses about the position two of the newer antipyretics (acetanilid and phenacetin) assume according to experience up to date. In relation to phenacetin it is stated that " . . . . we may meet with unpleasant and profuse diaphoresis, rendering its habitual use in phthisis and typhoid fever undesirable; collapse and exhaustion are not unknown even after medium doses, while palpitation and oppression of breathing followed by nausea and vomiting have likewise been observed. Cutaneous eruptions, chiefly urticarious, prevail with a frequency scarcely inferior to antipyrin; and cyanosis of the face due to changes in the haemoglobin may be seen to a similar degree. In short, we may meet all the ill effects of the aromatic group, though the incidence is undoubtedly less. Its use as an antipyretic, however, remains small, as its power in that respect is not equal to the others except when given in doses that are very often associated with symptoms of intoxication."

*Phenocoll* (amido-para-acet-phenetidin), the antipyretic, although still largely in use, has been little written upon during the past year, and nothing of value can be noted.

*Physiological Phenomenon.* Although not strictly within the scope of these comments, still of interest and possibly of profit, will be the following account of "An Ingenious Toy."<sup>2</sup>

"A toy has recently been brought out which will possess interest to all who have studied colour vision and the physiological side of optical science. It is extremely simple, consisting of a flat, circular disc mounted as a top. One half of the disc is white, the other black. On the white half are drawn in different positions small segments of black circles concentric with the circumference. If one were asked to prophesy what would be the result of the fusion of black and white colour sensations which occurs in spinning the top, one would possibly say gray. But the remarkable fact is nevertheless true that the rings appear coloured—red, yellow, blue, and violet. On reversing the top, the order of the colours is reversed. The top is the invention of Mr. C. E. Benham, who calls it the artificial spectrum top. His explanation of the phenomenon

<sup>1</sup> Brit. Med. Journ., vol. ii, for 1894, page 1444.

<sup>2</sup> As related in the Brit. Med. Journ., vol. i, for 1895, page 272.

is not, however, satisfactory. The top has been shown at the Physiological Society, but the assembled physiologists failed to advance any explanation at all. Colour sensations as the result of mixing black and white are not altogether unknown to physiologists, but there has never been any good hypothesis advanced to account for them. The subject demands renewed and careful study, and we shall await with interest a scientific reason for this curious phenomenon."

*Piperazin* (di-ethylene-di-amine) continues to be largely used, but from the reports of the year, investigations have been chiefly in the line of its value as a solvent of uric acid stones in urine. Dr. J. Fawcet, F. R. C. S., of London, England, conducted some experiments in this line, and in view of the paper published by Dr. John Gordon, of Aberdeen, Scotland (alluded to here last year), he published a "Note" and gives some of his results. He concludes :

"Although a watery solution of piperazin has a marked effect, yet a solution of piperazin in urine of the strength used—that is, about 1 in 1,000—has no effect whatever. The slight increase in weight was again, no doubt, due to deposit of phosphates on the stone. In Dr. Gordon's experiments the strengths of solutions of piperazin in urine were 1 per cent., 2 per cent., 5 per cent., and 7.5 per cent., and no experiments were done with solutions weaker than these. But according to Dr. Gordon's own showing, when 2 grammes of piperazin were taken daily, only 0.3 gramme of unoxidised piperazin was excreted. This is about 0.02 per cent., taking 1,500 c.cm. as the normal amount of urine passed daily. As, therefore, his experiments do not deal with anything like such a percentage of piperazin in the urine, they do not in any way prove the therapeutical value of piperazin as a solvent of uric acid.

"It appears, however, from the powerful action of piperazin in a watery or an alkaline medium that it is along these lines any real advance in testing its therapeutical value can be obtained, and I am at present conducting experiments from this point of view."<sup>1</sup>

*Pixol*, the tar soap "cheap disinfectant" alluded to here last year, has been practically unheard of during the past year, and no doubt has retired.

*Pyoktanin* (methyl-violet)—the anilin dye "pus destroyer"—has had comparatively little attention paid to it during the past year in the current medical literature. This may be partially due, as one observer writes, to its medicinal properties not being fully

<sup>1</sup>Brit. Med. Journ., vol. ii, for 1894, p. 1426.

understood as yet, and that it must be more closely and thoroughly studied.

*Pyretine*—the new antipyretic and analgesic of last year—has not been reported on during the year just passed.

*Resol*—the proprietary disinfectant similar to creolin—has not been reported on during the year.

*Resorbin*—the new excipient emulsion of almond oil, yellow wax, gelatin, soap, and lanolin, alluded to here last year—has been practically unheard of during the year just passed. It has been previously remarked that little evidence has yet been produced to prove its superiority over the officinal oleic acid.

*Resorcin* (officinal) apparently holds its own in the medical world and but little new has been reported. Dr. Moncorvo, of Rio de Janeiro, Brazil, however, has again advanced the theory that pertussis is a local affection and that microscopical examination has proved the existence of the specific microbe. He claims to have found this microbe in the sputum and reproduced the affection by inoculation of animals. To attack this microbe he has observed that the most effective remedy yet found is a one per cent. solution of resorcin applied locally to the larynx.

Dr. Boeck recommends the following formulae in the treatment of frost bite :

Resorcin . . . . .	1 part
Ichthyol . . . . .	1 “
Tannic acid . . . . .	1 “
Water . . . . .	5 parts

To be well mixed and applied at night time by means of a brush. If any one of the above ingredients is objectionable in any case he offers the following :

Powd. Talc. . . . .	1 part
Resorcin . . . . .	2 parts
Acacia mucilage . . . . .	5 “
Water . . . . .	5 “

To be well mixed and applied as in the other formula.

*Salaktol* (salactol) is the very unfortunate and misleading name adopted by the manufacturers in Bremen, Germany, for the patented combination (?)—rather mixture—of hydrogen dioxide solution one per cent., sodium salicylate and sodium lactate (proportions not given).

Dr. Wallé has met with remarkable success in a series of fifty-

two cases of diphtheria in every variety of the affection and age of patient—all were successful (!!).

Local applications were made every two or three hours in every case possible, but if the age or rebelliousness of the patient prevented, inhalations were conducted every two hours, lasting fifteen minutes. The temperature fell rapidly and the swelling, headache, backache, and pain in the neck and limbs quickly disappeared. There were no sequelae: no paralysis and no nephritis.

This agent is also recommended as a prophylactic, to be used in weak solution as a gargle.

Nothing has been heard of it in this country as yet.

*Saligenin* is not a new chemical, but has not been produced heretofore under conditions favourable to its use in medicine. Dr. Lederer, of Germany, has now succeeded in producing it synthetically from phenol and formaldehyde, and has thus brought it more prominently before the profession. Reports are still meagre, but it has been successfully tried in seven cases of acute rheumatism and one of gout. Ill effects were not produced when administered in doses varying from five hundred milligrammes to one gramme (7.7 to 15.4 grains) every one or two hours. It is given either in the powder form or in the following dilute solution :

Saligenin . . . . .	2 per cent.
Alcohol . . . . .	15 “ “
Distilled water . . . . .	83 “ “

Of this solution one or two tablespoonfuls every hour is the dose.

*Salipyrin*, reported to be a true salicylate of antipyrin, is now considered by some as a mere mixture of the component parts, which fact goes toward bearing out the comment made here last year that nothing yet has been reported to show that far better results cannot be obtained from the administration of the salicylic acid and antipyrin in proportions varying with the circumstances of each case, rather than be compelled to give the proportions offered in the mixture.

Its uses during the past year have been apparently constant in the same line as reported here last year, especially in the treatment of uterine haemorrhages. Dr. E. G. Orthmann, of Berlin, Prussia, has recently reported on fifty cases where it was given in sixty-five milligrammes (one grain) doses three times a day. His results varied, and although he found it worthy of attention, still he looked to further researches as being most desirable.



*Salol* (phenyl salicylate) keeps prominently before the medical profession, no doubt sustained there by now being recognised in the United States Pharmacopoeia. According to reports, it continues to be classed by many as far from being a safe agent, for poisoning cases are still too frequent.

Its use in cholera is still being pushed, and with reported benefit in quite a list of cases. However, its promoters do not offer an altogether satisfactory explanation of its lack of success in some patients.

It is reported to have been used successfully in rheumatic affections and scarlet fever, but the cases are too few yet to substantiate the claims.

*Salophen* (acetyl-para-amido-salol) continues to be considered by the majority of those who have used it as an agreeable (tasteless), efficient, and safe agent in acute and subacute cases of rheumatism, but appears to fail in chronic cases. Even as much as this cannot be said of sodium salicylate and other anti-rheumatic agents.

Dr. Bertram H. Waters, A. M., of New York city, relates in detail his hospital practise of twenty-five cases, and concludes :

“In reviewing the cases just enumerated, it will be seen—

1. That in almost every case improvement has been rapidly effected, and the average length of time for reduction of fever has been six days, as against eight days for the *ol. gaultheriae* and nine days for sodium salicylate.

2. That no complication more serious than the extension of the process to other joints was observed.

3. That the average length of hospital treatment has been,—under salophen, eighteen days ; for *ol. gaultheriae* and sodium salicylates, each twenty-five days approximately.

It should be noted that this in every case includes after-treatment with iron and tonics.

4. That in no cases have gastric, renal, or constitutional disturbances been observed, while all have developed under the other drugs.

When the disparity in the number of cases reported is remembered, this seems a clear point in favour of the new remedy, thirteen cases of salophen having been collected, as against seven of salicylate and five of *gaultheriae*.

Finally, as it is exceedingly easy of administration and is not at all unpleasant to the taste, it answers the last condition demanded.

There is one objection which can be made to its use, and that is

a valid one, especially in hospital practise, viz., that it is expensive. It is to be regretted that in these cases the data as to the duration of treatment with the drug are not exact enough to warrant a conclusion as to the relative amount used. From the margin in its favour in the entire duration of ward treatment in these cases perhaps the objection could be met."<sup>1</sup>

Dr. Pierre Marie, of Paris, France, reported his results with this agent at the meeting of the Medical Society of Hospitals, on May 31 last, and substantiated Dr. Waters's results.

Much more will undoubtedly be heard from this agent.

*Salubrin* is the fancy name given to a patented mixture of

Acetic anhydride . . . . .	2 per cent.
Acetic ether . . . . .	25 "
Alcohol . . . . .	50 "
Water . . . . .	23 "
	<hr/>
	100

Its action being too strong in the above formula, it is recommended to be diluted all the way from two to six parts of water to one of the mixture. It is extolled as an efficient antiseptic and haemostatic in contusions, skin affections, rheumatism, pleuritis, influenza, and to relieve the coughing in pulmonary troubles.

Nothing is known of it in this country as yet.

*Salumine*—the new astringent of last year—has been unheard of since last alluded to.

*Senega Root* has been repeatedly noticed with a distinct odour of oil of wintergreen and adulteration was suspected until Goldener showed that under certain conditions many plants of the natural order polygalaceae afford methyl salicylate, and therefore the supposed adulterant was a natural constituent of the root.

It is noticed that the Swiss pharmacopoeia has adopted the test for salicylic acid in the ether extract of senega root, to identify it as being the true root.

*Somnal*—the liquid hypnotic compound made by the union of chloral, alcohol, and urethane—has received little prominence during the year.

The only notice of much account comes from Russia. Dr. Khmiélefski, of Odessa, published an interesting article upon the relative value in asylum practise of chloralose, somnal, and trional as hypnotics. Trional was fairly certain and rapid, but is con-

<sup>1</sup> N. Y. Med. Journal, vol. lxi, p. 659.

tra-indicated in melancholia, hypochondriasis, or whenever any mental depression is present. Chloralose is somewhat less certain. The quantity required varies much in different cases and at different times in the same person. It acts more rapidly than trional, but sleep is less prolonged. Somnal was found, in the few cases in which it was given, to be a valuable and reliable agent. The sleep approached natural sleep. In some respects it possessed advantages over the other two agents. It was, however, contra-indicated if any gastro-intestinal disturbance was present, as it tends to increase this.

*Sozo-Iodol* (di-iodo-para-phenyl-sulphonic acid) has been little heard of during the past year. It looks now as if it would gradually pass out of notice.

*Spermin* has an increasing number of advocates, but on the other hand many are still skeptical.

Dr. Alexander W. Poehl, of St. Petersburg, Russia, has continued his observations and is still more convinced than ever that this is a most important agent. He expanded the subject lately in the Berlin Medical Society and the discussion brought out diverse views. He still holds to his explanation of its action as referred to here last year.

*Sulphonal* (di-ethyl-sulphon-di-methyl-methane) continues to be a very prominent agent in the practitioner's hands, although caution is urged and exercised pretty generally.

As a hypnotic, the proper quarter to look for the fairest and most unbiased report is the insane asylum. Dr. B. D. Evans reports the experience of the Morris Plains Hospital, Morristown, N. J., as follows:

"This may be called a sister drug to trional, as it belongs to the same family—in fact it is the elder sister. It is not suited to the treatment of insomnia incident to melancholia, for not an infrequent symptom following its use is a feeling of decided depression and mental confusion. In many cases it has shown very decided toxic effects in small doses, while in others large doses are well borne. As small doses as fifteen grains have in several instances produced alarming symptoms, causing great depression of the heart's action, and a condition of collapse. It frequently upsets the stomach, causing vomiting and loss of appetite. While it is fairly sure to produce sleep, it is slow of action, the average time after administration before sleep comes on being about three hours.

"Occasionally an eruption over the body follows its use. After a continued use, the urine is found to be of a dark colour, which a

microscopical and clinical examination proves to be from the presence of haematoporphyrin, and in some cases large quantities of indican. Our experience with this hypnotic teaches us to be very cautious in its administration, to watch closely the effects of the first doses in a patient who has not previously taken it, and always to discontinue its use when the urine gets dark."

Dr. Edmund Andrews, of Chicago, Ill., professor of clinical surgery in the Northwestern Medical school, after reading the comment on this agent made here last year, writes as follows :

"I see that you, in common with other authors, speak of sulphonal as if it were only a hypnotic. I found some years ago that it had a singular anti-spasmodic quality, and in consequence of my brief writings and personal statements on that point, it is considerably used in Illinois for that effect.

"In the painful muscular spasms after fractures of the thigh, and of some other bones, its effects are surprising in effectually suppressing the spasms without necessarily inducing sleep. Opium will do it as long as the patient keeps awake, but the moment he drops asleep he is liable to be aroused by the spasms. Sulphonal suppresses them totally by night or day, without any reference to whether the patient is asleep or awake.

"Some healthy men are troubled by cramps in the limbs at night. Sulphonal taken occasionally—sometimes only once a week—prevents them. The effect seems to be very prolonged.

"Some cases of persistent hiccough are stopped by it.

"Some surgeons use it to arrest nocturnal emission of semen with striking effect, the action seeming to be by arresting the nocturnal spasms of the ejaculatory muscular fibres that expel the semen.

"I do not know that any one has tried it in epilepsy or tetanus.

"Its hypnotic and anodyne powers are feeble.

"I have not seen it produce any of the alarming symptoms often described when given in ten or fifteen grain doses for cramps once in a day or two, or in eight grain doses for nocturnal emissions given two or three times a day."

Mr. J. A. Shaw Mackenzie, M. R. C. S., of London, England, recommends this agent in railway and sea-sickness. He reports as follows :

"Inquiry elicits the fact that there are many who suffer from railway sickness. I am not aware that direct attention has been given to this special cause of megrim ; I am satisfied, however, that the inconvenience is real and that there are many who are

more or less knocked up by a long journey, and in whom a railway journey of two hours produces as much dread and misery as a sea passage. I venture to draw attention to the value of sulphonal in these cases, and to suggest its further and more extended trial in both railway and sea journeys. In children train sickness is common, while in adults railway megrim varies from undue fatigue and inability to sleep the same night to intense headache, sickness, and prostration coming on after some two hours in the train. The dose of sulphonal would vary, of course, according to the severity of the symptoms and the length of the journey. In my own case I find that ten to fifteen grains are sufficient for the day journey to Edinburgh, while twenty to thirty grains in divided doses are necessary for the night and day journey to the North of Scotland. The following cases are further illustrative :

“1. A married woman, who generally suffers from headache, nausea, and sleeplessness, after a long journey, took on starting fifteen grains of the drug. She traveled from London to Newcastle-on-Tyne on a day journey without headache and sickness, while refreshing sleep followed at night.

“2. Another married woman, who journeyed from Paris to Pau, on taking ten grains, felt well and fresh, while her governess and little boy, who are usually sick, traveled better and were not sick on taking ten and five grains respectively. She thinks a second dose might have been taken by them with advantage.

“3. A single woman, who journeyed from London to Cannes, after taking fifteen grains, did not feel the journey more than in going from London to York, though usually knocked up. I might say I have tried antipyrin, phenacetin, the bromides, and chloral, but have not experienced the same benefit as with sulphonal. An aperient dose the day before traveling is, I think, advantageous, while facing the engine or lying down is helpful. As to the value of sulphonal in sea-sickness I can only produce three cases in its favour. Many patients who suffer from railway sickness do not suffer from sea-sickness, or only slightly.

“1. A married woman, traveling from London to Guernsey, who was usually sea-sick, after taking ten grains had a good journey and was not sick.

“2. A single woman, traveling from London to Flushing, who was always seasick in the calmest weather, after taking fifteen grains slept well and was not sick, arriving fresh.

“3. A married woman, traveling from London to Dublin, who had always been sick and dreaded the journey, after taking ten



grains slept well, was not sick, and arrived altogether fresh and well.”<sup>1</sup>

*Symphoral* (sodium-cafein-sulphonate)—the new synthetic diuretic, alluded to here last year—has not been reported upon during the year.

*Tablets.* The following criticism of what is appropriately called “The Tablet Fad,” is extremely timely, and deserves repetition and emphasising here :

“Unquestionably, one of the greatest evils from which legitimate pharmacy and medicine suffer, is the indiscriminate use of compressed tablets. Beginning in a small way, they have gradually increased in use, until now they threaten to overthrow all other forms of preparation. Their convenience, portability, and cheapness are elements that appeal to many, and in the case of inorganic chemicals and well-defined organic compounds, like strychnine, morphine, atropine, etc., they afford, in many cases, a valuable means of drug-administration, but the danger to legitimate pharmacy and medicine lies not in the use of the tablet, but in its abuse ; and it is upon this matter that we wish to speak.

“In the evolution of drug-administration, different forms of preparations have successively arisen. Crude drugs have been followed by infusions, and these by tinctures, extracts, fluid extracts, and active principles. None of these, however, has wholly replaced the others. Each class has shown especial value, and met special indications in disease treatment. Hence, as a result, medicine has had her implements of treatment largely increased, and pharmacy has broadened in work.

“But in the use of tablets, a different result is sought. The tablet faddists claim that all medicinal preparations should be given in the form of tablets, and, like all extremists, they are wrong. After the fad is over, it will be found that tablets afford a valuable means of drug-administration, in certain cases, and may be used at times with advantage. That they will permanently replace all the older forms of preparation, we do not believe possible, especially in the case of preparations of drugs of organic origin, for the reason that tablets cannot be made to contain the same proximate principles, in the same soluble form, and in the same proportion, as found in various galenical preparations. Even if it were possible to do this, the tablet does not afford the readiness of assimilation and resulting promptness in action given by other forms of preparations, notably the liquid ones.

<sup>1</sup> The London Lancet, vol. i, for 1895, p. 1434,

“Now, when physicians learn that they cannot get as good therapeutical results with tablets as with other forms of medicaments, they will use tablets for special cases only—after the present fad subsides, for, like all other men, including the pharmacist, the modern physician must have his fad.

“The abuse of the tablet lies in the endeavour made to have it replace all other forms of drug preparations. Notably is this so in the case of tablets alleged to represent tinctures and fluid extracts. Granting that the liquid preparations be rightly made, we believe that the heat used in concentrating and drying them with the diluent to make the powder for the tablet, must result in an alteration of the proximate principles of the drug, both in proportion and kind.

“Heat is a most important factor in altering the character and amount of active principles in a drug preparation. Take, for example, digitalis infusion. M. Roger has shown<sup>1</sup>, that the toxicity of digitalis infusion is very notably diminished when the product of maceration is simply concentrated on a water-bath; from 90 to 150 times the amount of the heated product being required to cause death, as compared with the cold water product. What is true of infusion of digitalis when heated, is very probably true of other drug preparations.

“How the commercial tablets, alleged to represent galenical preparations, are made, is known only in a general way; each manufacturer following his own working details. We have been informed, however, on good authority, of a practise pursued by one manufacturer in the making of tablets of the so-called narcotic tinctures (*i. e.*, aconite, belladonna, digitalis, etc.) which, if true, is open to the severest censure. This manufacturer, finding that his tablets of these tinctures stuck together on keeping in stock, adopted a new procedure. Instead of making the tablets contain the tincture in minims, as represented, he makes a fluid extract of the drug, evaporates to a thick consistency, washes with petroleum benzin to remove resin, colouring matter, and benzin soluble extractive, spreads on plates, dries with heat, and makes up into tablets.

“Now, apart from the question as to whether this benzin treatment removes or alters any active principles or not, the fact remains that such tablets are not what they are represented to be. Instead of being made of tinctures, as claimed, they are made of fluid extracts, concentrated by heat, washed with a solvent that removes

<sup>1</sup> Amer. Journ. Pharm., 1889, 174.

certain proximate principles, and then heated to eliminate the persistently remaining traces of benzin, which heat probably modifies, if it does not destroy, the remaining proximate constituents. The most enthusiastic tablet faddist can hardly claim that tablets made in this way are fit to replace properly-made tinctures.

“Whether this practise is followed by other manufacturers or not we do not know, but we believe that the surest way for physicians to get the best therapeutical results, with drugs of organic origin, is to use properly made tinctures and other galenical preparations made by pharmacists. These preparations may vary somewhat, from natural causes, in their proportion of active principles, but they vary no more than the varying personalities of sick patients, and, as they are usually given until physiological effects are had, the danger in the use of non-standardised preparations of potent drugs is more apparent than real, and has been greatly exaggerated.

“We believe that tablets have had their day, or rather have reached their zenith of popularity, and, like every form of drug-preparation that has preceded them, will pass away, in part, at least, to make room for something else ; and when this takes place, physicians will then be found to cry to the new-comer, as they do now with the older galenical preparations, and the compressed tablet : ‘*Le roi est mort. Vive le roi!*’ It should be the aim of physicians and pharmacists everywhere to work together to discourage the abuse of the tablet form of drug-administration.”<sup>1</sup>

The following is likewise pertinent here, and it is urged that it also may be very carefully considered : Having occasion to remove from their old-resting place the books and instruments in his father’s office, the editor of the *Medical Age* “found a parcel of tablet triturates recently left by the representative of a tablet manufacturer. A brother practitioner occupied a neighbouring office, and the tablets were handed to him for future use. The gift was vigorously declined : ‘No, thank you ; I don’t want them. I don’t employ them myself, and I think it’s a sin to counsel their use. These tablet triturates are doing serious mischief. Many of our young practitioners, fresh from college, are not strong in their therapeutics. When at a loss for suitable remedies, they look up the price-list of the tablet maker, ascertain the various remedies employed in the given disease, make their pick, and then dispense. Suppose I have a case of bronchitis. I simply look up bronchitis in the list—I see ‘bronchitis tablets’—*Eureka!*’”

<sup>1</sup> Alumni Report.—Pharm. Journ. and Trans., vol. xxv, p. 583.

"It is plain that under these circumstances the young physician is not specially impelled to acquire a solid knowledge of therapeutics. Study is hard work, and of most men it is emphatically true that they study only what they must. The tablet triturate is accordingly an ever-present temptation ; it demoralises—it causes the physician to look upon his price-list as a compendium of therapeutics, deludes him into the notion that he has found a quick and easy road to the cure of disease, or at the best begets a mechanical, routine habit of prescribing.

"No one will venture to compare tablet triturates with the wonderful instruments of precision which have been introduced into modern medicine—the stethoscope, the fever thermometer, the sphygmograph, the pleximeter, etc. And yet we have heard veteran practitioners, who used and valued these auxiliaries at their true worth, deplore the effect which they were plainly exerting on the younger generation of medical men. Too great is the reliance placed on these instruments of precision—too little the pains taken to train the perceptions. Not a few treat the thermometer instead of the fever. Frequently the physician becomes the slave of his implements, and what were intended as his aids prove his undoing by inducing a neglect to cultivate the eye, the ear, the touch."<sup>1</sup>

*Tannal* (aluminium tannate)—the astringent—has not been heard of during the year past.

*Tannigen* (acetyl tannin)—the odourless and tasteless form of tannin, insoluble in water and acids but readily soluble in alkaline solutions—is theoretically an elegant form in which to administer tannin as it passes the stomach and accomplishes its beneficial results in the intestinal tract.

Dr. C. Künkler, of Bonn, Germany, has made careful experiments with this agent in 41 cases of chronic gastro-enteritis, mostly children. Those as young as one year were treated, and many had been unsuccessfully treated with naphthalin and bismuth. Apparently all were greatly benefited and some of them were claimed to be "cured." Dr. Künkler recommends that tannigen be tried in typhoid fever.

*Tetronal*—closely allied to sulphonal and trional—has received even less attention than last year, but is often mentioned in direct comparative relation to its two allies. Sulphonal has in its composition two ethyl radicles, trional has three and tetronal four. It was claimed at one time with some degree of truth that the hyp-

<sup>1</sup> The Pharm. Journ. and Trans. vol. xxv, p. 584.



notic effects of this class of agents were in direct proportion to the number of ethyl radicles. This is still claimed with some reason as existing in the case of sulphonal and trional, but apparently fails when the tetronal limit is reached. Tetronal is reported to have all the disadvantages of sulphonal without its power—its action being more sedative than hypnotic. When administered, all the precautions required for sulphonal and trional must be observed.

Dr. B. D. Evans of the Morris Plains Hospital (Insane), of Morristown, N. J., reports that in the hospital's experience, it is not as reliable as either sulphonal or trional, but in a few exceptional cases has been "attended with gratifying results." In two cases, "unpleasant symptoms resulted, the most prominent of them being vertigo, dryness of mouth and fauces, metallic taste in the mouth, and locked secretions."

*Thermodin* (acetyl-para-eth-oxy-phenyl-urethane), the patented, mild antipyretic, closely allied to neurodin, has been practically unheard of during the past year except through the manufacturer's advertising.

*Thioform* (so-called bismuth di-thio-salicylate), made up of a combination of bismuth, sulphur, and salicylic acid, is still before the medical profession for approval, but is kept there largely by the efforts of the enterprising manufacturers, for little has been reported upon it during the past year—its main advantage over iodoform being its lack of odour.

Only two prominent observers thought it important enough to give their experiences with it during the year. Dr. A. Steuer, of Austria, employed it in the treatment of favus, moist eczema, and purulent otitis media with success, and Dr. Rogman, of Ghent, Belgium, has found it of great advantage in his ophthalmological practise when using it to reduce the secretion in conjunctivitis, and in ulcerations of the cornea, where very marked beneficial results were obtained.

*Thiol*—the German artificial ichthyol—is confined pretty largely to the dermatologists, and little is heard of it from other quarters.

Dr. A. Bilder, of Berlin, Prussia, however, has found it of great service in the treatment of burns of all degrees of severity. After properly cleaning off and preparing the surface, a solution of equal parts of thiol and water is applied and protected by a greased cotton layer bandaged over the affected part. Healing takes place rapidly, leaving a healthy surface.

*Thiosinamin* (allyl-sulpho-carbamide) has been little heard of



during the year, but no doubt it has continued to be used in the treatment of lupus as before.

The only prominent report upon it comes from Dr. A. Békéss, of Vienna, Austria, who treated twenty-nine children and one woman affected with scrofulous adenitis, by injecting a five per cent. alcoholic solution hypodermically in the interscapular region of each side alternately, with a good proportion of beneficial results. The effect on the swollen glands was greater the younger the child, and of no value when the adult age was reached. Both the general condition and the appetite, however, were decidedly improved in all of the cases.

*Thymol*, now being officinal, is, therefore, assured a permanent position before the professions of medicine and pharmacy for at least ten years. It still continues to be used successfully as an anthelmintic, and reports are published of the successful treatment of lupus by subcutaneous injections of guaiacol and thymol.

*Thyroid Extract* continues to receive marked attention throughout the medical world, and fully as much has been written upon it as last year.

It has been recently wisely remarked that now-a-days it is being used many times with more enthusiasm than discretion for about the same variety of affections as last year. Some failures have occurred, but many reported successes have followed its use in as great a variety of affections as the following: ichthyosis, pityriasis rubra, psoriasis, lupus, cretinism, universal alopecia, chronic insanity, tetanus, exophthalmic goitre, myxoedema, obesity, uterine fibroma, and even ozoena. Some reports of fatal results have been published, but it is stated that more than one unrecorded death has occurred. Experiments on the lower animals are now proving its toxic properties.

*Toluol* (methyl-benzene) has recently been suggested by Professor Löffler, of Greifswald, Prussia, as effective in the treatment of diphtheria. He combines it with other agents as follows:

Absolute alcohol . . . . .	60 per cent.
Toluol . . . . .	36 " "
Ferric chloride solution . . . . .	4 " "
<hr/>	
100	

and adds sufficient menthol—10 grammes (154) grains—to deaden the pain due to the irritation of the mixture. Wadding is used to apply it. He reports having saved all of his cases out of the 71

treated. Out of another series of 26 cases treated after the second day of the disease, he only lost one. The further development of the bacilli is not only checked by this agent, but fully matured bacilli are destroyed.

*Tolypyrin*—an analogue of antipyrin—has received little attention during the past year. There does not seem to be a place for it.

*Tolysal* (tolypyrin salicylate)—the antipyretic—has practically passed out of notice, so little has been reported upon it.

*Traumaticin* is not new by any means, and it has already had an extended use for certain purposes. It, therefore, is instructive to learn of the most advantageous method of preparing it.

“Traumaticin is a saturated solution of gutta-percha in chloroform; it is most advantageously prepared as follows:—the lightest coloured gutta-percha procurable is cut into small pieces and macerated with twelve or fifteen times its weight of pure chloroform for twenty-four hours, with frequent agitation. The mixture is then transferred to a retort, and about one third of the chloroform distilled off over a water bath. The traumaticin thus obtained is a thick, homogeneous liquid, to which the requisite medicament may be added. For ichthyol traumaticin, three parts of ichthyol are added to every ten parts—similar proportions are used for salol, lysol, and phenol. Corrosive sublimate is added in the proportion of 1 part of sublimate for 100 parts of simple traumaticin. If the simple traumaticin should be coloured, and a colourless medicament is to be added, it may be decolourised by means of animal charcoal. It is best applied with a brush of hog’s bristles, and forms a thin, impermeable, pliable pellicle when the chloroform dries off. It gives rise to no discomfort, except a sense of burning when first applied, due to the chloroform. Traumaticin of ichthyol is of special service in the case of erysipelas.”<sup>1</sup>

*Traumatol* (iodo-cresol)—one of last year’s substitutes for iodoform—has apparently not been found to assume the prominence expected of it, for nothing has been reported on it.

*Tri-kresol*—the antiseptic mixture of 35 per cent. ortho-cresol, 40 per cent. meta-cresol, and 25 per cent. para-cresol—has not received much attention during the past year. Dr. Clarence O. Arey, of Cleveland, Ohio, appears to be about the only one who has reported upon it, and the reason for his report was purely accidental, having obtained “some results that at first seemed strange, but that were afterward explained as being caused by the action of

<sup>1</sup> Pharm. Journ. and Trans., vol. xxv, p. 1024.

the trikresol contained in the solution" of toxin of the diphtheria bacillus, which he was studying, leading him to experiment with it in guinea-pigs, and conclude that it "is a very safe antiseptic, as no such quantities as were employed here would ever be introduced into the body in the proportions that are used in antiseptic mixtures."<sup>1</sup>

*Trional* (di-ethyl-sulphon-methyl-ethyl-methane)—closely allied to sulphonal—has received considerably more attention than last year. Notwithstanding a few cases of toxicity, it has proved itself of marked value. Some observers are enthusiastic over it, while others cannot admit that it has any advantages over sulphonal, chloralose, chloral, or other hypnotics. It has been repeated by more than one observer, that if certain very plain precautions are followed, it is one of the best and relatively safest of all the true hypnotics. It is apparently most useful in the insomnia of neurasthenics accompanied with depression. In some cases of excitement, it is also useful.

Dr. A. Claus, of Ghent, Belgium, strongly recommends it as a hypnotic for children of all ages. It is to be avoided, however, in the insomnia of meningitis, and is of little service when it is caused by pain. It is specially applicable in chorea and convulsions.

Recently Dr. G. Spitzer, of Vienna, Austria, published his results in the treatment of twenty-five cases of various forms of disease in which pain and insomnia are prominent. In nineteen cases it succeeded. They were cases of lumbago, intercostal neuralgia, carcinoma uteri, chronic bronchitis, emphysema, myelitis, sciatica, mitral stenosis, fatty heart, tabes dorsalis, pulmonary and laryngeal tuberculosis. In the six remaining cases, it either failed, or acted only for a short period, and had to be followed up with morphine. His conclusions were as follows: "It is not only a hypnotic for different forms of diseases of the mind, but acts fully as well in pulmonary and cardiac cases. Sleep is generally produced rapidly, and continues during the following night. Some patients continued stupid with sleep even the whole of the following day, but generally the sleep was normal in its action. Bad effects on the circulation or respiration were not noticed in any case. In a few cases retching, and even vomiting, occurred on waking, which could only be explained by idiosyncrasy of those patients. The results were also excellent in insomnia, due to intercostal neuralgia, rachialgia, sciatica, lightning pains of tabes, and even the

<sup>1</sup> Phila. Med. News, vol. lxvii, p. 68.

pain accompanying cancer. The effects were more nearly those of morphine than of any other hypnotic."

It is natural to look for fair, unbiased opinions from insane asylums when considering agents of this class, for they are in constant need of them, and yet have no other interest to serve than the good of the patients. Dr. B. D. Evans reports from the Morris Plains Hospital, Morristown, N. J., as follows :

"A careful observation of the results in 600 administrations of this drug during the year, has commended it to us as an important acquisition to our list of hypnotics. Given in twenty-five-grain doses, it is prompt in its action, producing a peaceful sleep in from ten minutes to half an hour after taking.

"The sleep, following the use of this drug, more closely approximates normal, healthful sleep than that following any other hypnotic used in this hospital during the year. The drowsiness and sluggish feelings that follow the use of sulphonal and numerous other drugs, the day following the night of administration, are not attendant upon trional. Dryness of mouth and fauces, lowering pulse-rate and tension, headache and nausea, imputed to this drug by some therapists, have not occurred in its use at this hospital; such symptoms must be rare, or only present when very large doses are given. The sleep resulting from trional is devoid of waking intervals. It has given very gratifying results in cases of maniacal excitement with insomnia, in a few cases where paraldehyde has failed. The bulk of the dose is an objection, but the taste is not bad. It may be given in wine or hot milk.

"Trional acts promptly, is eliminated quickly, and is, therefore, not attended with serious or depressing after effects."

*tuberculin* (parataloid) has received much less attention in the medical literature during the past year than was given to it before, but no doubt the study of it continues with unabated interest and on new lines. Much adverse criticism still exists. Dr. C. Theodore Williams, F. R. C. P., delivered an inaugural "Address on the Modern Treatment of Pulmonary Phthisis," before the Midland Medical Society, at Birmingham, England, on November 1, last, and, in speaking of the different stages of development of the treatment, having first mentioned "the wonderful discovery of the bacillus tuberculosis, by Koch, which placed the specific character of the disease beyond all question, and reduced all forms of tubercle to the same category," he writes :

"The next event in the history of the treatment of phthisis was the employment of Koch's tuberculin injections, which turned out

to be a failure, but from which many wholesome lessons may be learned, one of which was that any treatment which promotes, not conservative, but destructive changes, as shown in breaking down of the lung tissue and its appearance on a large scale in the sputum, cannot be otherwise than detrimental to the patient, as the area of infection, instead of being limited, is thereby considerably widened. Another lesson was that certain morbid poisons possess a distinctly elective affinity for certain organs, and appear to select old lesions in those organs. The quickness with which the lupus spots and tuberculous lesions, in the lungs, became the seat of active change, was very remarkable, and the rapidity with which tuberculous masses of long standing broke down, and cavities were formed, was even more so."<sup>1</sup>

On the other hand, Dr. George W. Balfour, in a personal correspondence with the editor of the *Edinburgh Medical Journal*, in May last, writes as follows :

"Tuberculin seems to have a great future before it, but rather as a preventive than as a cure for consumption. Its chief action seems to be to confer immunity from the action of the bacillus tuberculosis, and it would probably be most profitably employed as a prophylactic before the development of any serious pulmonary disease. But the successful employment of such a prophylactic not only holds out the hope that this scourge of humanity may be, if not entirely extinguished, at least greatly limited in its extension, but would also confer other important benefits on mankind. In veterinary medicine, for instance, there is a wide field for the employment of such a prophylactic, and its success in this department would have a most important bearing on the well-being of mankind.

"From the violence of its action tuberculin would seem to be a true toxin, and the immunity resulting from its use to depend upon the development of an antitoxin in the blood of those submitted to its action. There is every reason to believe that a procedure similar to that by which the antitoxin of diphtheria is produced would result in the formation of an antitoxin of tubercle, and that this antitoxin would confer immunity from tuberculosis *tuto, cito, et jucunde* without any of the risks or disagreeables inseparable from the most cautious employment of tuberculin itself.

"Even as we now have it, tuberculin, used with proper care and caution, is capable of arresting pulmonary tuberculosis when taken

<sup>1</sup> The London Lancet, vol. ii, for 1894, p. 1021.



early, conferring at the same time immunity from subsequent attacks for four years, possibly for the rest of life. When the disease is further advanced it is still able to modify the progress of the disease, and sometimes to prolong life, though it can never be expected to restore tissues already destroyed.

"As we hope to have it ere long, the modified tuberculin—antitoxin of the bacillus tuberculosis—will give us a prophylactic at once safe and innocuous, which will defend and protect our loved ones from this hitherto fatal scourge with as much certainty as vaccination protects them from the ravages of small-pox."<sup>1</sup>

The line of investigation foretold by Dr. Balfour seems to promise greater things than any other.

The following post-mortem investigation of the lungs of one of Dr. Koch's earliest tuberculin patients is of interest at this time :

"Adami relates the history and post-mortem appearances of a Finnish patient, who came under Koch's care in 1890, suffering from haemoptysis, cough, night sweats, and progressive emaciation. After fifty-two weeks of repeated tuberculin inoculations his health appeared to be entirely restored. In June, 1893, he went to Canada and was employed as a skilled mechanic at the McGill University. In January, 1895, the old symptoms all returned, and on April 28th he died of haemoptysis. At the necropsy firm adhesions were found at both apices, which showed well-marked fibroid changes, and contained well-encapsuled caseous masses and small contracted cavities. In these parts the tuberculous process had evidently been arrested, but the rest of the lung tissue contained numerous miliary tubercles distributed along the course of sundry bronchi. The tubercles were most numerous in the neighbourhood of the old mischief; they were surrounded by very little pneumonic disturbance, and were rather of the fibroid than the rapidly advancing type. The second attack was thus not the result of fresh infection, but of the recrudescence of the old process starting from the incompletely healed disease foci. Their nature indicated either relative attenuation of the bacilli, or increased resistance on the part of the tissues. In any case, a year's treatment by Koch's method had succeeded in arresting for four years an active and extensive tuberculous process in both lungs."<sup>2</sup>

*Weights and Measures* by the decimal (metric) system celebrates its centenary this year and continues to receive increasing atten-

<sup>1</sup> Edinburgh Medical Journal, vol. xl, p. 1053.

<sup>2</sup> Brit. Med. Journ. Epitome, vol. i, for 1895, p. 68.

tion. It is gratifying to realise that now all of the prominent nations (except Great Britain and Russia) and most of the smaller ones, have adopted this system. Very marked agitation of the subject, however, has been going on in Great Britain during the year, and particularly so at this time, for the preliminary steps are now being taken to issue a new edition of the British Pharmacopoeia, in which the properly authorised committee has decided to introduce the decimal system along with the old. The new Decimal Association has so skillfully and persistently kept the subject to the front that it has won a great victory in gaining recognition from Parliament, in so far as to obtain the following report to the House of Commons, by the select committee on Weights and Measures :

“Your committee believes that the adoption of the metrical system by England would greatly tend to render that system universal.

“Your committee recommends :

“(a.) That the metrical system of weights and measures be at once legalised for all purposes.

“(b.) That after a lapse of two years the metrical system be rendered compulsory by act of Parliament.

“(c.) That the metrical system of weights and measures be taught in all public elementary schools, as a necessary and integral part of arithmetic, and that decimals be introduced at an earlier period of the school curriculum than is the case at present.”<sup>1</sup>

It will be some time, no doubt, before Parliament will agree to the change, but a most marked step in advance has surely been made to have progressed so far.

Although Russia has taken a very decided position in favour of the metric system, as alluded to here last year, still she cannot yet be considered among those who have permanently adopted it.

Tunis (under French protection) formally adopted the system last March, and on September 16, 1896, the same will be obligatory in the United States of Mexico, thus substituting the old Spanish system.

<sup>1</sup> Pharm. Journ. and Trans., vol. xxvi, p. 34.

## MEMOIR OF MATTHEW DICKINSON FIELD, M. D.

By STEPHEN SMITH, M. D., of New York County.

Dr. Matthew Dickinson Field was born in Nashville, Tenn., July 19, 1853, and died in New York, on the 8th of March, 1895. Within the compass of the forty-one years, seven months, and seventeen days of his life, the following events personal to him occurred, viz. :

He received his preparatory education at Monson Academy, Mass.; was graduated from Williams College, in the same state, class of 1875; was graduated in medicine from Bellevue Medical College, class of 1879; on October 1, 1878, was appointed to the resident medical staff of Bellevue Hospital, and on April 1, 1880, completed his term of service; in 1881, was appointed visiting physician to Charity Hospital, and served three years; in 1882, was appointed sanitary inspector of the health department, and served two years in the corps of inspectors of typhus fever cases; in 1882, was appointed examiner in lunacy to the Department of Public Charities and Corrections, which place he held to the date of his death; on October 1, 1883, was appointed surgeon to the Manhattan Railway Company, which office he continued to occupy.

In 1885, he married Miss Lucy Atwater; five children were born to them. His wife and the two youngest children survive him. The death of the elder children, a son and two daughters, had a visibly depressing effect on him. One of these daughters lived to the age of five years, and was a child of great beauty and promise. He recovered somewhat his usual cheerfulness on a trip to Europe, but his heart affection soon after began to impair his general physical condition. During the last year he visited Spain, and returned with his brother, who was commander of the school ship. He greatly enjoyed this voyage, and his health was temporarily improved; but the impairment of the heart, which had so long existed without seriously embarrassing him, began to increase with fatal rapidity, and at the end of four months terminated his life. He suffered chiefly in his latter days from dropsical effusions, which finally created much dyspnoea, but he bore his disabilities

with great fortitude and cheerfulness. The end came quietly on Friday, March 8, 1895.

On Monday, March 11, a quiet service, largely attended by the medical profession, was held at his residence, and on the following day he was laid beside his three children in the cemetery at Stockbridge, Mass.

Dr. Field inherited good New England blood, being an immediate descendant of the famous family of Fields of Stockbridge, Mass. His father was a brother of David Dudley, Stephen J., Cyrus W., and Henry M. Field,—men who have been greatly distinguished for half a century. His father was a civil engineer, and took an active and responsible part in the preparation and laying of the first Atlantic cable. It has been alleged, on good authority, that at one time the effort to lay the cable would have been abandoned altogether had not Dr. Field's father pledged its success.

To appreciate Dr. Field's mental force, it is necessary to mention the physical disabilities which tended to diminish his energies and embarrass him in the performance of professional and social duties. In early life he suffered from hip disease, which required excision of the head of the femur. This resulted in diminished growth of the limb, and the necessity of permanently using a crutch. He was also the victim of severe valvular disease of the heart, which appeared before he reached manhood and finally proved fatal to his life. In spite of these crippling disabilities, Dr. Field performed the regular duties on the staff of the hospital; as a sanitary officer of the board of health, he inspected the largest tenement houses with commendable thoroughness and punctuality, and in every other sphere of duty his indomitable will achieved success.

The special studies to which Dr. Field was attracted were of a medico-legal character. As the examiner in lunacy for the Department of Charities and Corrections, and as surgeon to a great railroad corporation, he was frequently in the courts as a witness in a variety of cases of litigation. It is as a writer on questions relating to insanity that he will hereafter be known to the profession, and, although his contributions to this branch of medicine were not numerous, all of his papers give unmistakable evidence of careful observation and judicious discrimination of facts. The more important of these papers are,—“Is Belief in Spiritualism Ever Evidence of Insanity Per Se?” “Othaematomae;” “The Influence of the Attending Physician in Litigation Cases.”

Dr. Field had a genial, happy temperament, which made him a favorite in social circles. Although his duties were often very arduous, he was never disconcerted by their pressure nor dismayed by the labour which they exacted. With uniform cheerfulness he undertook the accomplished work from which others, far more capable physically, would shrink with self-distrust.

He was a very active member of medical societies, as appears from the following, viz. : He was a member of the American Academy of Medicine, the Society of Medical Jurisprudence, the Alumni Society of Bellevue Hospital Medical College, the Medico-Legal Society, the Neurological Society, and the New York County Medical Society.

Dr. Field was an ardent lover of flowers and of natural scenery. His enthusiasm for the country, and especially for the hills and woods which he had known as a boy, drew him, in his vacations, to his early home, for which he always cherished a filial pride and tender attachment. In the beautiful scenery of the Berkshire hills he found that solace in his infirmities and afflictions, and that uplifting and inspiring influence, which only a true lover of nature can fully enjoy and appreciate. Among my last recollections of an interview with him was his glowing description of the scenery of the Azores, and especially of the profusion and magnificence of the flowers which everywhere greeted the traveller.

It is consoling to reflect that though Dr. Field died on the very threshold of mature manhood, his life was lengthened far beyond the expectation of his friends and advisers ; that in spite of the most disabling physical infirmities and diseases, he maintained a personal activity in the performance of professional duties unexcelled by any of his classmates and contemporaries ; that he won an honourable fame in the specialty to which he devoted his attention ; and, finally, that he rests peacefully beside the children whose lives and deaths were the sources of his greatest joys and sorrows, and amid that glorious scenery where in life he found consolation and inspiration.

"The hills,  
Rock-ribbed and ancient as the sun,—the vales  
Stretching in pensive quietness between;  
The venerable woods,—rivers that move  
In majesty, and the complaining brooks  
That make the meadows green; . . .  
Are but the solemn decorations all  
Of the great tomb of man."



## MEMOIR OF WILLIAM FITCH, M. D.

By H. O. JEWETT, M. D., of Cortland County.

Dr. William Fitch was the son of William Fitch, also a physician, of English descent, who settled in an early day in Bridgewater, and afterwards in Franklin, Delaware County, N. Y., locating upon a farm, combining a moderate practise with agricultural pursuits. The son, the subject of this sketch, was born in Franklin, on the 26th of January, 1823. His early boyhood was spent upon a farm, performing light labour during the summer and attending school in winter. His academical education was obtained at the Delaware Institute, in Franklin. In the year 1844 he entered the Albany Medical College, and graduated therefrom in 1846.

After practising a short time, he married Miss Urania Everett in 1847, and settled in Virgil, Cortland County, N. Y., and remained there till 1858; then removed to Dryden, where he resided till the time of his death. His wife survived him only a few months. They left three daughters, viz., Libbie, the wife of I. B. Fulkerson, of Dryden; Katie, the wife of Archibald Miller, of Eagle Grove, Ia.; and Mary E., unmarried, and living in Dryden.

As a citizen, Dr. Fitch was liberal and public spirited, gentlemanly in his deportment, kind and true in all his domestic and social relations. He was a patron of learning, much interested in educational matters, aided largely in securing the graded system of instruction in the public schools, and was for several years president of the board of education in his town.

Though mainly engaged in practise, he kept abreast of the science of medicine, and was familiar with the literature of his profession. He was a member of the New York State Medical Society, and one of the Founders of the New York State Medical Association, of which he was a consistent member till the time of his death, ever loyal to its ethics and alive to its interests.

Never enjoying very sound health, his practise was mostly in the village and its immediate vicinity, where he resided, ministering alike cheerfully to the rich and the poor. He did not spare himself, or refuse a call on account of the poverty of the patient,

and, like most of the earlier practitioners of medicine, he was apparently indifferent as to the prospect of pecuniary reward. Yet, with all his generosity and his gratuitous services to the poor, his industry and frugality secured to him a fair competency for the support of his declining years.

As a practitioner, he was efficient, yet cautious and conservative, ever free and ready to call wise counsel whenever the urgency of a case or the safety of a life seemed to require it. He made no pretensions to surgery, except as he was prepared to treat most of the injuries resulting from accidents occurring in a common country practise.

In his attention to the sick he was assiduous, tender, and sympathetic, while his quiet manner and amiable expression of countenance were of themselves a solace to the sufferer.

In short, Dr. Fitch was an excellent type of the faithful, conscientious physician, and if he did not "die with the harness on," he at least continued to discharge the duties of his calling till the handicap of years and increasing infirmities admonished him to relinquish arduous labour and care for his waning strength.

After two or three years of gradual decline from an asthmatic trouble, complicated with cardiac and other local ailments, it became apparent to those around him that he was rapidly nearing his end, and he at last sank quietly down, and passed away on the 14th of September, 1893, in the seventy-first year of his age, leaving the bright record of an upright man, a good physician, and an affectionate husband and father.

## MEMOIR OF JAMES G. PORTEOUS, M. D.

By WILLIAM CRAMER, M. D., of Dutchess County.

Dr. James G. Porteous was born in Moriah, Essex County, N. Y., on January 3, 1839. He received a liberal education, entering the Medical department of Harvard University in 1860. He remained until 1862, when he entered the army, and after the war was over he returned and was examined and received his diploma from the University of Harvard in 1865. On leaving Harvard in 1862 he was examined for the position of surgeon, which he successfully passed, but refused to accept the same as he considered himself incompetent. He was appointed assistant surgeon of the One Hundred Eighteenth Regiment New York Volunteers in the War of the Rebellion. While with this regiment, and subsequently, he greatly distinguished himself by his bravery and coolness in action, making it his invariable practise to accompany the command wherever it went, nobly sharing in its dangers and privations, on the march and under fire. He was in many of the battles and campaigns of the Army of the Potomac, and served throughout with the Army of the James, being especially conspicuous at South Anna, Siege of Suffolk, City Point, Drury's Bluff, Cold Harbor, Second Fair Oaks, Chapin's Farm, Fort Harrison, Petersburg, and Five Forks. He was known in the army as the "fighting surgeon," and his bravery on the occasion of the capture of Fort Harrison, while his regiment formed a portion of the Army of the James, elicited the following complimentary mention in the general orders of the commanding officer, Gen. B. F. Butler:

"Assistant Surgeon J. G. Porteous, One Hundred Eighteenth New York Volunteers, deserves the highest credit for his bravery and attention to duties, being the only surgeon in the brigade advancing with his regiment in charging column."

After the close of the James River campaign the doctor was promoted to surgeon, and transferred to the Forty-sixth Regiment, New York Volunteers, with which he remained until the close of the war. As a surgeon, his services in the army were invaluable. Returning home, the doctor married Sarah F. Wilbur, on Sept. 21, 1865,

and settled at Luzerne, New York, where he successfully practised his profession. Being an active Republican he was elected supervisor of his county for seven consecutive terms. In the year 1872, by the unanimous voice of the Republican convention, he was nominated for the Assembly and subsequently elected by a decided majority, in a county oftentimes closely contested. Here he also represented his constituents in a highly creditable manner. In the year 1880 Dr. Porteous was induced to locate in Poughkeepsie by several prominent persons, whom he had successfully treated, and from the day of his coming, he has had a large and constantly increasing practise. He has been remarkably successful in the treatment of difficult and obstinate diseases, which was one secret of his great success. Dr. Porteous was a member and one of the Founders of the New York State Medical Association and took a very active part in all of its meetings, and was a very earnest worker for its advancement; he was president of the Fifth District Branch in 1885 and 1886, and worked very industriously for the success of its advancement at the time the meeting was held at Poughkeepsie. This also made him a vice-president and a member of the council. He was also a delegate from the New York State Medical Association, to the American Medical Association at Detroit, Milwaukee, and Baltimore; also a delegate to the Pan-American Medical Congress at Washington. On the establishment of the library he was one of the first to give a valuable collection of books and pamphlets. Although a busy practitioner he managed to attend nearly all the meetings of the Association, as well as those of the Fifth District Branch. He also contributed some very important papers at these meetings, notably, "Winter Cholera in Poughkeepsie," "Prevention of Disease," and others. He also contributed papers of interest to the medical journals and the local papers of Poughkeepsie. He has written several papers against the system of supplying Poughkeepsie with river water. Dr. Porteous was health officer of Poughkeepsie for two years. As a citizen, he did his duty to the utmost, striving constantly to secure good government by teaching the ignorant, and by the exposure of swindlers, and by always upholding the best men and the best measures.

With his professional brethren and with the public he may not have been universally popular, because he fearlessly expressed his opinion in words which, though just, were sometimes unpalatable. Having carefully made up his mind, he sought the attainment of his object in the most straightforward manner. As a public spir-

ited man he was always ready to lend a hand, or to lead in promoting a good work he had no superior. Dr. Porteous is survived by a wife and three daughters, two married and living away from home, and one unmarried, living at home with her mother. His aged mother, who is over eighty years old, is still living at Luzerne, near Saratoga. To show the love and esteem with which the doctor was held among his patients I quote in full a poem written by one of them:

TO MY BELOVED PHYSICIAN, JAMES G. PORTEOUS.

O dear physician, friend,  
Lying so calm and silent, motionless  
In very room where thou so kindly  
Welcomed rich and poor alike,  
And listened patiently  
To all the ills and woes of frail humanity.

O strange to see those hands that now are folded  
Pale and still in death,  
That so much wrought for us  
To keep us from the death  
We never thought could come to thee,  
So strong thou wert to bring relief,  
Thy sympathy so true and deep,  
To help us bear the pains and ills of our humanity.

Kind friend, beloved physician!  
Thy labours all are done;  
Thy rest well-earned begun!  
Thy memory fresh and green will be  
Through all the years that come to me,  
Thy kindly acts ne'er be forgot  
Blooming in many a lonely spot.

But oh, it seems we cannot live  
When thou art gone so far away,  
With healing in thy hands,  
Yet faith will teach us day by day  
That somewhere, sometime. meet we will,  
In land not far away.

Again to show how well he was liked by all classes, his friends rich and poor have erected a monument of granite, cube shaped, over the place of his burial. Dr. Porteous was a thirty-second degree Mason, a member of the Loyal Legion, Mystic Shrine of New York, G. A. R., and the Ancient Order of United Workmen.



## MEMOIR OF ORRIN G. SELDEN, M. D.

By ROBERT SELDEN, M. D., of Greene County.

Orrin George Selden was born in Perthshire, Scotland, April 9, 1817. When he was seven years old his parents came to America, settling in Massachusetts, where he was educated, and when a young man, scarcely twenty-one, he went to Ohio, and in the village of Washington, Guernsey County, began the practise of medicine. He was of a restless, roving disposition, and soon moved to Tuscarawas County, residing at different times in Shanesville, New Comerstown, New Philadelphia, and Canal Dover, until 1873, when he removed to Wisconsin, residing and practising his profession in Tomah and Reedsburgh, and some five years later removed to this state, residing in Catskill up to the time of his death, which occurred January 29, 1895, in the seventy-eighth year of his age.

In 1841 he, with other physicians of the county, organised the Tuscarawas County Medical Society, and was the last one of its founders to pass away. In 1851 he became a member of the Ohio State Medical Society, and was an active worker in the society as long as he lived in the state. In 1869 he was appointed by the Ohio State Medical Society chairman of a committee to procure from the legislature a law legalising the dissection of human bodies, the law of the state, at that time, prohibiting such dissection under penalty of fine and imprisonment. At the next meeting of the society the committee reported the success of their labours. In recognition of their efforts in behalf of medical teaching, and of the profession, Miami Medical College of Columbus, Starling Medical College of Columbus, and Charity Hospital Medical College of Cleveland, conferred on each member of the committee the honourary degree of Doctor of Medicine.

During the Civil War Dr. Selden, with others of the profession of the state, volunteered their services to Surgeon-General Barr for any emergency that might arise, and as he saw fit to call upon them after the Battle of Stone River, he went to Nashville to assist in the care and transportation of Ohio's wounded soldiers.

Soon after going to Wisconsin the legislature of the state created a state board of health. Dr. Selden was named one of the original

members of it, and served acceptably until he removed to Catskill.

He was a member of the American Medical Association; one of the original members of the New York State Medical Association, and of the Greene County Medical Society, having been president of the latter. When the Second District Branch of this association met in Catskill he delivered the address of welcome.

He was an uncompromising supporter of the code of the American Medical Association, and all his life was opposed to the "isms" and "pathies" that have so often disturbed the profession; he had no patience with their notions and would have none of it. He took an active interest in the educational matters of the communities where he lived, and served many years on the different boards of education.

In politics he was a Democrat, a member of the Masonic order, a past-master in the Ohio jurisdiction as well as that of New York.

He was twice married,—first to Catharine L. Hall of Shanesville, Ohio, who died in January, 1877. Three children were born to them, two daughters and one son,—one daughter and the son survive. In Catskill he married Mrs. Elizabeth Crosby, who died in 1893.

## REPORTS OF THE DISTRICT BRANCHES.

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### FIRST DISTRICT BRANCH.

[The death of Dr. Ezra Graves, at the time when arrangements for the meeting should have been made, left the Branch without a secretary, hence, no meeting was held.—E. D. F.]

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### SECOND DISTRICT BRANCH.

The eleventh annual meeting of the Second District Branch of the New York State Medical Association was held in Hudson, Wednesday, May 29, 1895.

The morning session was called to order at 11:30 by the president, William H. Hodgman, M. D.

The address of welcome was made by Dr. Thomas Wilson, of Claverack.

The president delivered a very interesting address.

Dr. J. C. Hannan read a paper on "Lunatics, and their Victims," in which he related some personal experience.

Dr. C. E. Fritts read a paper on a very peculiar case of "Hystero-Epilepsy."

Remarks were made by Dr. E. D. Ferguson.

A paper on the cause and prevention of the "Senile Cataract" was read by Dr. L. F. Adt. The paper was discussed by Drs. F. A. Smith, C. E. Fritts, and H. Lyle Smith.

Dr. E. D. Ferguson read papers: (1) "A Clinical Note on the Treatment of Epilepsy before the Habit is formed"; (2) "An Instance of Change in Type of an Ovarian Tumor," with specimen.

Dr. Ferguson exhibited a portable operating table, an invention of one of the members of the Association.

The meeting at this point adjourned for dinner, which was served at the Worth House.

The afternoon session was called to order at 2:45.

The report of the treasurer was as follows:

Amount collected by registration, 1892-'93-'94 . . .	\$44.50
Amount collected at last meeting . . . . .	34.00
Amount per registration to date . . . . .	\$78.50
Disbursements from 1892 to 1895 for printing and postage	67.76
Amount in treasury . . . . .	\$10.74

On motion of Dr. Ferguson, the treasurer's report was accepted.

The motion of Dr. Ferguson, that the following members serve as the executive committee, for the ensuing year, was adopted :

Albany County,	Dr. William B. Sabin.
Clinton County,	Dr. E. M. Lyon.
Columbia County,	Dr. J. T. Wheeler.
Essex County,	Dr. C. A. Church.
Greene County,	Dr. George Conkling.
Rensselaer County,	Dr. F. J. Tompkins.
Saratoga County,	Dr. F. F. Gow.
Schenectady County,	Dr. Charles Hammer.
Schoharie County,	Dr. H. F. Kingsley.
Warren County,	Dr. D. J. Fitzgerald.
Washington County,	Dr. John Lambert.

On motion of Dr. Ferguson, the present secretary and treasurer was appointed to serve another year. Adopted.

A paper on "Bacteria, with some Historical Facts Concerning Them," was read by Dr. William Finder.

Dr. D. W. Houston read two papers: (1) "Pyosalpinx," with specimen: (2) "The Sub-Cutaneous Suture."

Remarks were made by Drs. Ferguson and Finder.

A vote of thanks was extended to the committee of arrangements for the very hospitable manner in which the association was received and entertained during the session and afterward.

After one of the best and largest meetings the association has had in years, the meeting adjourned, to meet in Schenectady on the last Wednesday in May, 1896.

After adjournment, the committee of arrangements had conveyances ready and took the members for a ride, and showed them the various places of interest about Hudson.

After a rousing reception at Dr. Ferguson's summer residence, the association returned home, well pleased from what they had heard, seen, and taken.

WILLIAM HODGMAN, *President*.  
JOSEPH E. BAYNES, *Secretary*.

### THIRD DISTRICT BRANCH.

The eleventh annual meeting of the Third District Branch of the New York State Medical Association was held in Binghamton, June 13, 1895.

The meeting was called to order by the president, Dr. F. W. Putnam, at 10 a. m.

Dr. J. G. Orton, chairman of the committee of arrangements, made the report for the order of the day, and was followed by the address of the president, "On Life Insurance."

Dr. H. O. Jewett, of Cortland, reported a case of narrow escape from death by lightning. Discussed by Dr. Higgins, who asked if any one present had tried the earth treatment in such cases. No response.

Next, a paper by Dr. Higgins, of Cortland, "Indications for Large Rectal Injections, and Methods for Using Them." Discussed by Drs. Brooks and Gouley. Dr. Gouley said that young men should read medical history. Flushing had been used or practised for a hundred years, particularly on the Continent.

An excellent paper on "Diphtheria and Antitoxin: Diagnosis and Treatment," by Dr. Chauncy P. Biggs, Ithaca, was discussed by Drs. Morrow and Brooks.

Dr. J. W. S. Gouley, of New York city, honoured our meeting by his presence, and read an interesting paper on "Retention of Urine from Urethral Stricture." This paper was discussed by Drs. Brooks, Ross, Biggs, and Higgins, all of whom had listened to or been under the instruction of the author in other days, and took the occasion to express their pleasure in listening to him again, in so instructive a paper.

### AFTERNOON SESSION.

The nominating committee presented their report, and the following executive committee was duly elected :

Dr. W. R. Laird, Cayuga County.  
Dr. J. G. Orton, Broome County.  
Dr. F. W. Ross, Chemung County.  
Dr. L. D. Brooks, Chenango County.  
Dr. H. O. Jewett, Cortland County.



Dr. W. B. Morrow, Delaware County.  
 Dr. Martin Cavana, Madison County.  
 Dr. Ely Van de Warker, Onondaga County.  
 Dr. W. J. J. Sweet, Otsego County.  
 Dr. Baxter T. Smelzer, Schuyler County.  
 Dr. Frank G. Seaman, Seneca Falls County.  
 Dr. W. L. Ayer, Tioga County.  
 Dr. Chauncy P. Biggs, Tompkins County.

The nominating committee reported that the next annual meeting would be held in Auburn, Cayuga County, and that Dr. Frank G. Seaman, of Seneca Falls, be made secretary.

"Intra-venous Transfusion of Saline Solutions, with Apparatus," by Dr. Ely Van de Warker, of Syracuse, was a very acceptable paper, because of the simplicity of the apparatus and methods employed. Discussed by Drs. Ross and Killen.

Dr. Ross of Elmira read a paper on "Faradic Currents of High and Low Tension," and exhibited much interesting apparatus.

Dr. William A. White, of the State Hospital, Binghamton, read an unusually valuable paper on "The Criminal: His Social and Legal Status, and the Philosophy of Reformation." It was earnestly discussed.

Dr. Orton moved that a vote of thanks be tendered to Dr. White for his able paper.

The history of a case of uterine haemorrhage, its complications, treatment, and results, was read by Dr. J. H. Martin, of Otego. This was followed by a paper on "Punctured Wounds of the Globi," by Dr. F. M. Michael, of Binghamton, and Dr. Jack Killen presented a specimen of iron, that had been imbedded in the eye for ten years.

On motion the meeting adjourned.

F. W. PUTNAM, *President*.

J. H. CHITTENDEN, *Secretary*.

## FOURTH DISTRICT BRANCH.

The eleventh annual meeting of the Fourth District Branch was held at the Genesee Valley Club, Rochester, June 11, 1895.

In the absence of President Townsend, Dr. E. M. Moore moved that Dr. Stone, of Leroy, take the chair.

The motion was carried, and the chairman called for the reading of the minutes of the last meeting.

The minutes were read by the secretary, and were approved.

Dr. Colvin reported the death of Dr. Nichols.

President Townsend at this point took the chair.

Dr. A. A. Jones moved that Dr. Woehnert, of Buffalo, be an invited guest to read a paper, in place of Dr. Stockton, and to take part in the discussion. Carried.

Upon motion of the secretary it was voted that Dr. Wheelock Rider be an invited guest, to take part in the proceedings.

The president appointed Drs. Taylor, Menzie, and Colvin, a committee to nominate the executive committee for the ensuing year.

The first paper of the session was read by Dr. A. A. Jones, of Erie county, upon "Gastric Disturbances Consequent Upon Influenza."

Dr. Menzie moved that Dr. H. Mann be an invited guest, to take part in the discussion. Carried.

Dr. Jones's paper was then discussed by Drs. E. M. Moore, Colvin, Hubbs, Ellinwood, and Fisher.

Dr. Albert Woehnert read the next paper, "A Case of Pancreatitis." The subject was discussed by Dr. Allen A. Jones.

Dr. William H. Thornton read a report of a "Case of Diphtheritic Croup, Treated with Diphtheria Antitoxin and Intubation. Recovery."

The subject was discussed by Drs. Goler, Townsend, Stone, and Park.

The treasurer reported that no assessment had been made since 1890.

Upon motion of Dr. Colvin it was voted that an assessment of one dollar per member be levied, to meet the current expenses.

Dr. Colvin reported for the committee on nominations in favour of the following executive committee :

Alleghany County,	Benjamin C. Wakely.
Cattaraugus County,	Orrin A. Tompkins.
Chautauqua County,	R. T. Rolph.
Erie County,	Charles A. Wall.
Genesee County,	Frank L. Stone.
Livingston County,	R. J. Menzie.
Monroe County,	G. W. Goler.
Niagara County,	Williams Q. Huggins.
Ontario County,	F. D. Vanderhoof.
Orleans County,	John H. Taylor.
Steuben County,	C. G. Hubbard.
Wayne County,	Darwin Colvin.
Wyoming County,	A. G. Ellinwood.
Yates County,	William Oliver.

Upon motion of Dr. Thornton the report of the committee was accepted and adopted.

Dr. G. W. Goler presented "A Ready Method of Detecting the Presence of the Gonococcus."

The method described was illustrated by the use of the microscope.

The association then adjourned.

M. W. TOWNSEND, *President.*

W. H. THORNTON, *Secretary.*

## FIFTH DISTRICT BRANCH.

The eleventh annual meeting of this branch was held at 315 Washington street, Brooklyn, on Tuesday, May 28, 1895.

The morning session was called to order at 11:25 a. m., by the president, Dr. Austin Flint.

The secretary read the minutes of the last meeting, which were adopted as read.

The report of the committee of arrangements was then read, accepted, and adopted.

The president announced that he had already appointed Dr. M. C. Conner as one member, and would now appoint Dr. N. W. Leighton as the other member, to act with the secretary as registration committee.

The president's address was next in order, but it was moved and carried that it be postponed until after the business of the branch had been transacted, in order that late comers might be favoured.

There was no report of delegates this year.

Last year's minutes of the executive committee were then read, as provided by the by-laws. This was immediately followed by their report for this year, as follows :

During the past year your committee have met only once, other minor business being transacted by circular letter. The secretary has continued to serve, although not formally elected according to the by-laws, on account of a lack of a quorum at the appointed meeting.

The financial condition of the branch is satisfactory, notwithstanding the business depression and unsettled condition of investments generally. During the reorganization of one of the railroads in which the branch funds were invested, the treasurer successfully transferred that security, in order not to delay the interest coming due. The reorganization has since been completed, after considerable delay, and the treasurer has now been given authority by your committee to obtain satisfaction for the old security, which now stands in his own name. The new security is equally valuable to the old one.

The receipts for the year were from assessments \$30, by interest \$67.43, making a total of \$97.43. The general expenses were

\$81.75. The increase in the permanent fund was \$50, making a total now in the fund drawing interest of \$1,230.

The treasurer's accounts have been duly audited and approved.

The committee have fixed the fourth Tuesday in May, 1896, for the next branch meeting, which will be the twelfth annual.

It is recommended that the branch extend a cordial welcome and full privileges of the floor to the three invited guests,—

Dr. T. Passmore Berens.

Dr. L. H. Miller.

Dr. Jerome Walker.

And the ten delegates from the Kings County Medical Association :

Dr. H. Arrowsmith.

Dr. L. G. Baldwin.

Dr. A. C. Brush.

Dr. A. B. Marion.

Dr. B. B. Mosher.

Dr. J. W. Parrish.

Dr. J. O. Polak.

Dr. F. W. Shaw.

Dr. J. S. Waterman.

Dr. J. Scott Wood.

There have been no resignations during the year past.

The treasurer was directed to make the annual assessment again at \$1, and to append to each bill, as before, the slip inviting all those Fellows to voluntarily join in the permanent fund by depositing \$5, which exempts them from future branch assessments. The thirteen Fellows who have joined the Association since the last branch meeting are, according to custom, exempted from assessment for the ensuing year.

This report was accepted and adopted.

The treasurer then read his annual statement, which was accepted, having been previously approved.

Under the head of "Report of Special Committees," the secretary reported for the committee on necrology that since the last annual meeting of this branch there have been four deaths among the Fellows of this district :

Dr. S. T. Hubbard.

Dr. H. Goldthwaite.

Dr. M. D. Field, of New York city.

Dr. J. G. Porteous, of Poughkeepsie.

Drs. Hubbard and Porteous were Founders.

The biographical sketches were then called for.



The secretary explained that he had received word from the writers upon the late Dr. S. T. Hubbard that the proposed sketch was to be of such a length and completeness that it was not practical to read it at this time, especially as a steel cut was being prepared to accompany it, all of which would appear in the State Transactions.

Dr. Charles Phelps's sketch of the late Dr. H. Goldthwaite was called for, but Dr. Phelps was not present.

The secretary then read, by request, Dr. Stephen Smith's sketch of the late Dr. M. D. Field.

As Dr. J. G. Porteous had died so recently (May 11), it could not be expected to have a sketch ready at this time, but, at his request, the secretary was authorised to arrange for such a sketch, and to refer it, with the other sketches, to the committee on necrology of the state association, for publication.

Under new business, the secretary read the greeting from the Second District Branch in return for one sent them from this branch last year. Also the programme of their meeting, to be held in Hudson, May 29 (to-morrow).

The president's address was then called for, which took the form, after a few preliminary remarks in relation to the branch, of a detailed relation of a case of the apparently rare affection, "Chyluria, Accompanying *Filaria Ganguinis Hominis*."<sup>1</sup>

Discussed by Dr. J. W. S. Gouley and the author.

The scientific papers of the morning were then taken up.

Dr. X. T. Bates's paper on "Living Bacteria in the Bladder" was called for, but Dr. Bates was not present.

Dr. Seymour Oppenheimer next read his paper on "The Advocation of a New Method of Operation for Marked Deflection of the Nasal Septum."

The discussion was opened by Dr. F. C. Raynor, and continued by Dr. L. H. Miller and the author.

The next business was choosing a nominating committee to nominate an executive committee for the ensuing year. The secretary called off the counties of the district in succession, and members from those counties chose the following

*Nominating Committee:*

Dutchess County,	Dr. I. D. LeRoy.
Kings County,	Dr. T. M. Lloyd.
New York County,	Dr. S. B. W. McLeod.

<sup>1</sup> Published in N. Y. Med. Journ., vol. lxi, p. 737.

Orange County,	Dr. M. C. Conner.
Putnam County,	(None present.)
Queens County,	(None present.)
Richmond County,	Dr. H. C. Johnston.
Rockland County,	(Vacant.)
Suffolk County,	Dr. Walter Lindsay.
Sullivan County,	(None present.)
Ulster County,	Dr. H. Van Hoevenberg.
Westchester County,	(None present.)

This committee was requested to meet during the coming intermission, in order to report their results at the afternoon session.

In next adjourning for lunch, at 1:05 p. m., the president extended a cordial welcome to all present to join the Fellows in an adjoining room.

The afternoon session was called to order by the president, at 2:35 p. m., and the reading of the scientific papers was resumed.

Dr. Frank Van Fleet opened the session with his paper on "The Abuse of Medical Charities."

Discussed by Drs. Jerome Walker, S. B. W. McLeod, and J. R. MacGregor.

When Dr. Edwin Barnes's paper on "Ectopic Pregnancy" was called for, Dr. Barnes was not present.

Dr. T. J. Barton's paper on "Overfeeding" was then read and discussed by Dr. Jerome Walker.

Dr. H. A. Haubold's paper was next read, on "The Propriety of Administering Digestive Ferments."<sup>1</sup>

The president, Dr. Austin Flint, discussed the paper, and while doing so asked Dr. S. B. W. McLeod to the chair.

Dr. Dwight L. Hubbard then read his paper on "Chronic Catarrhal Laryngitis, with Special Reference to its Aetiology."

The discussion was opened by Dr. Jonathan Wright, continued by Drs. L. H. Miller and T. Passmore Berens, and closed by the author.

Dr. Thomas H. Manley finally gave a few remarks, by the aid of several charts, in explanation of his more full paper on "A Few Clinical Notes on a Recent Series of Operations."<sup>2</sup>

The report of the nominating committee was then read, nominating the following executive committee to represent—

Dutchess County,	Dr. T. J. Barton.
Kings County,	Dr. R. M. Wyckoff.

<sup>1</sup> Published in State Transactions, vol. xii, p. 410.

<sup>2</sup> Published in New England Med. Monthly

New York County,	Dr. A. D. Ruggles.
Orange County,	Dr. M. C. Conner.
Putnam County,	Dr. G. W. Murdock.
Queens County,	Dr. E. G. Rave.
Richmond County,	Dr. H. C. Johnston.
Rockland County,	(Vacant.)
Suffolk County,	Dr. Walter Lindsay.
Sullivan County,	Dr. C. W. Piper.
Ulster County,	Dr. H. Van Hoevenberg.
Westchester County,	Dr. H. E. Schmid.

On motion, the report was accepted and approved and the committee discharged.

The president then called a meeting of this committee for immediately after adjournment, to elect a secretary for the ensuing year, but it was found that a quorum was not present, therefore the meeting was not held.

Adjourned, at 5:10 p. m., to meet on the fourth Tuesday in May, 1896.

AUSTIN FLINT, *President*.

E. H. SQUIBB, *Secretary*.

The register showed forty-two Fellows, four delegates, and five guests present.

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#### EXECUTIVE COMMITTEE.

A called meeting of the executive committee was held at 315 Washington street, Brooklyn, on Tuesday, May 28, 1895. The meeting was called to order by the president, Dr. Austin Flint, at 10:25 a. m.

Present :	Dr. Austin Flint.
	Dr. Wm. McCollom.
	Dr. M. C. Conner.
	Dr. H. Van Hoevenberg.
	Dr. H. C. Johnston.
	Dr. E. H. Squibb.

Six members present, seven absent, and one vacancy.

The secretary read the minutes of the last meeting, which were approved as read.

The secretary announced that the circular vote for the committee of arrangements now serving proved to be unanimous.

The following report of the committee of arrangements was read and, on motion, approved :

REPORT OF THE COMMITTEE OF ARRANGEMENTS FOR THE ANNUAL  
MEETING, 1895.

Being convinced of the successful carrying out of the arrangements for last year, your committee begs leave to report that it has directed the secretary to repeat them, as far as practicable, for this meeting, and trusts that they may meet with the same general satisfaction.

Respectfully submitted :

[Signed] R. M. WYCKOFF, *Chairman*.  
J. C. BIERWIRTH.  
N. W. LEIGHTON.  
T. M. LLOYD.  
WILLIAM McCOLLOM.  
AUSTIN FLINT, *President*, } *Ex-officio*.  
E. H. SQUIBB, *Secretary*, }

April 1, 1895.

Upon motion, the president next appointed Dr. M. C. Conner to act with the secretary as registration committee, together with another Fellow from the general meeting later.

The secretary reported the death of four Fellows of this district for the past year,—

Dr. S. T. Hubbard, on June 1, 1894.  
Dr. H. Goldthwaite, on January 3, 1895.  
Dr. M. D. Field, on March 8, 1895.  
Dr. J. G. Porteous, on May 11, 1895.

The treasurer next read his itemised account and annual statement, as follows :

TREASURER'S ANNUAL STATEMENT, MAY 22, 1894, TO MAY 27, 1895.

*Fifth District Branch, New York State Medical Association,  
with E. H. Squibb, Treasurer.*

DR.

To balance cash as per statement May 22, 1894	\$152.80
Assessments collected . . . . .	30.00
Interest . . . . .	67.43
	————— \$250.23

## CR.

By rent of meeting rooms for tenth annual meeting . . . . .	\$10.00	
Catering for tenth annual meeting . . . . .	50.00	
Postage . . . . .	13.00	
Printing . . . . .	3.75	
Cigars for eleventh annual meeting . . . . .	5.00	
Balance on hand . . . . .	168.48	
	<hr/>	\$250.23

## PERMANENT FUND ACCOUNT.

## DR.

To total amount of fund as per statement May 22, 1894 . . . . .	\$1,180.00	
Contributions to fund to date . . . . .	50.00	
	<hr/>	\$1,230.00

## CR.

By investment in railroad bond (5 per cent. int.)	\$830.00	
Balance on hand at interest . . . . .	400.00	
	<hr/>	\$1,230.00

The cash book and vouchers were handed to Dr. M. C. Conner, who was selected by the president to audit the accounts.

The treasurer then explained in detail how he had to surrender that part of the permanent fund consisting of the two \$500 Georgia Pacific Railway bonds, to Drexel, Morgan & Company, for reorganisation purposes, and how, owing to a prolonged delay, the treasurer substituted in the branch treasury one of his own personal bonds of equal value (Virginia Midland Railway), in order not to embarrass the branch income for the year. In so doing, he personally assumed the reorganisation bonds until adjustment should be accomplished. Part of the adjustment consisted of twelve shares of preferred stock of the new Southern Railway Company, but it was made out in the name of the branch. Therefore, to recompense the treasurer, he asked at this time to receive authority from the executive committee to sell those shares. This was given in the following form of minute:

At a meeting of the executive committee of the Fifth District Branch of the New York State Medical Association, held May 28, 1895, it was resolved that the treasurer, E. H. Squibb, be authorised to sell a certificate of twelve shares of preferred stock of the Southern Railway Company, No. D 406.

[Signed]

AUSTIN FLINT, *President.*



The time and place for the next meeting was then brought up, and, upon motion, it was decided that the next meeting should be the twelfth annual, to be held in Brooklyn, on the fourth Tuesday in May, 1896.

The secretary reminded the committee that he was still holding over, as he had not been elected according to the by-laws on account of the lack of a quorum at a meeting called for that purpose.

The following invited guests were expected to be present :

Dr. T. Passmore Berens, of New York city.  
Dr. L. H. Miller, of Brooklyn.  
Dr. Jerome Walker, of Brooklyn.

Also the following delegates from the Kings County Medical Association :

Dr. H. Arrowsmith.  
Dr. L. G. Baldwin.  
Dr. A. C. Brush.  
Dr. A. B. Marion.  
B. B. Mosher.  
Dr. J. W. Parrish.  
Dr. J. O. Polak.  
Dr. F. W. Shaw.  
Dr. J. S. Waterman.  
Dr. J. Scott Wood.

On motion, a hearty welcome and full privileges of the floor were extended to these gentlemen, both guests and delegates.

The secretary then read a return greeting from the Second District Branch in response to a similar greeting sent from this branch last year ; also an announcement and programme from the same branch, stating their eleventh annual would be held in Hudson, on May 29.

On motion, it was resolved to continue the practise of the last few years in having the secretary follow up the papers offered to the branch, in order that they may be duly recognised, and published if possible.

The secretary had no resignations to report for the past year.

After some informal discussion, it was moved and carried that the treasurer continue the annual assessment at \$1, and in sending out the assessment bills to all those who had not joined the permanent fund, to append the usual slips inviting all to join *voluntarily* by depositing \$5 ; those in arrears for \$6 and over, not to be offered such privileges until arrears be paid.

On motion, the thirteen Fellows who had joined our association

since the last meeting were exempted from assessment for 1895, according to custom.

The outline report of this meeting, to be read to the general meeting, was then submitted and approved.

Dr. Conner here reported that he had examined the treasurer's book and vouchers, and found them in accord.

On motion then, the accounts were approved.

Adjourned at 10:55 a. m.

[Signed]              E. H. SQUIBB, *Secretary.*

# NEW YORK COUNTY MEDICAL ASSOCIATION.

## ANNUAL REPORT.

The closing of another year calls for the presenting of another annual report. Counting from October, 1894, to October, 1895, the following may be taken as a brief review of the scientific work of that period: Papers and discussions on

### PRACTISE OF MEDICINE.

At the meeting October 15, 1894, (1) "Posture in Anaesthetic Accidents;" (2) "The Use of Sedatives in Heart Disease;" (3) "The Efficacy of Icthyol in Inflamed Tissue;" by Prof. H. A. Hare, M. D., of Philadelphia. Discussed by Drs. Dunham, Leale, and Anderson, and closed by Dr. Hare.

November 19, 1894, was read a paper on "Habitual Constipation—Its Treatment," by Dr. Henry Illoway. Discussed by Drs. J. Lewis Smith, S. W. Dana, and J. G. Coyle, and closed by Dr. Illoway.

December 17, 1894, "How to Examine Sick Children," by Dr. J. Lewis Smith. Discussion by Drs. G. T. Harrison, J. B. White, H. Illoway, and others, and closed by Dr. Smith.

On the same evening, "A Treatment of Diphtheria on Antiseptic Principles," by Dr. C. G. Am Ende, followed by a short discussion, in which several members took part.

At the meeting February 18, 1895, a short but interesting paper on "Recurrent Haemaglobinuria," by Dr. L. F. Bishop, was presented, with description of a case.

On March 18, 1895, the following subjects were presented: "Modern Treatment of Laryngeal and Pulmonary Tuberculosis; with Demonstration of Instruments and Specimens," by J. W. Gleitsmann, M. D., and, by invitation, Carl Von Ruck, M. D., of Asheville, N. C. Dr. Gleitsmann: Historical Sketch. "Laryngeal Tuberculosis: Local Treatment; Surgical Treatment." "Pulmonary Tuberculosis: Climatological Treatment." Dr. Von Ruck: "Hygienic Treatment; General Management of the Patient; Specific Treatment." Discussion by Drs. F. J. Quinlan, Adler, and others, and closed with Dr. Gleitsmann.

April 15, 1895, "The Significance of Eye Symptoms in Bright's Disease, with Some Remarks on the Necessity of a More Rigid Enforcement of the Laws Relating to Medical Practise," by Frank

Van Fleet, M. D. Discussion by Drs. J. B. White, J. H. Claiborne, G. H. Cocks, W. H. Bates, and J. Hapburn, and closed by Dr. Van Fleet.

On the same evening, a paper on the "Therapeutic Use of Electricity in the Application of Dry or Moist Heat in the form of Electro-Thermal Asbestos Pad ; with Exhibits and Description of Apparatus," by J. W. Moore, M. D., was read.

At the meeting of May 20, 1895, a paper entitled "Multiple Cerebro-Spinal Sclerosis, with Report of a Case," by W. C. Gilday, M. D. Discussed by Dr. E. Von Dönhoff, F. Putnam, and others, and closed by Dr. Gilday.

#### OBSTETRICS AND DISEASES OF WOMEN.

At the meeting February 18, 1895, a paper on "The Neuroses of Women," by T. J. McGillicuddy, M. D. Discussion by Drs. H. J. Boldt, N. G. Bozeman, and others, and closed by the author of the paper.

On April 15, a paper as follows : "Symphysiotomy, with Report of a Successful Case," by Thomas R. Savage, M. D. Discussed by Drs. W. T. Lusk, G. T. Harrison, H. J. Boldt, E. E. Tull, and others ; closed without further remarks.

#### DISEASES OF THE EYE AND EAR.

Paper of March 18, 1895, was on "Syphilis of the Eye and Its Appendages," by Dr. H. S. Oppenheimer. Discussion by Drs. J. W. S. Gouley, MacGregor, and Hepburn, and closed by Dr. Oppenheimer.

Meeting May 20. Subject of paper was "Tincture of Iodine in the Treatment of Chronic Suppurative Inflammations of the Ear," by F. P. Hoover, M. D. Discussion by Drs. Hepburn, Payne, and others, and debate closed by Dr. Hoover.

#### ORTHOPAEDICS.

May 20, 1895, a paper was read on "Deformity Caused by Adduction and Flexion in Hip Disease," with a mechanical demonstration thereof, by A. B. Judson, M. D. Discussion by Drs. L. A. Sayre, Von Dönhoff, and others, and closed by Dr. Judson.

#### STATE MEDICINE.

Meeting June 17, 1895. Paper on "State Medicine—The Physician as a Citizen," by Douglas H. Stewart, M. D. Discussion by Drs. Deynard, Van Fleet, White, MacGauran, and closed by the author.

OTHER SUBJECTS, UNCLASSIFIED.

At the meeting October 15, 1894, Dr. N. S. Westcott "Exhibited a Chart Illustrating Mortality Tables Used by Life Assurance Companies." It was accompanied with an oral description clearly setting forth the methods now recommended by the actuaries of the best known companies.

At the meeting November 19, 1894, a very instructive paper was read on the following subjects: (1) "Medico-Chirurgical Notes on the Works of Hippocrates and Galen." (2) "Anaesthetics in the Early and Middle Ages," by R. Harcourt Anderson, M. D. Discussion by Dr. J. J. E. Maher and others, and closed by Dr. Anderson.

At the meeting June 17, 1895, the subject chosen was "Living Greek—The Language of Physicians and Scholars—A Language Easily Acquired," by Dr. Achilles Rose. With his usual enthusiasm, Dr. Rose urged the more general use of the Greek, and as an evidence of his belief that it was a language easily acquired, he introduced his daughter, a child of six years of age, who spoke and sang in that language. The consideration of the subject was closed with some remarks by the president, suggesting that any of the members expecting to attend the International Congress in Moscow should be prepared to take part in the discussion in advocacy of its more general use.

In addition to formal papers and accompanying discussions, cases were presented as follows:

Professor Hare demonstrated on the cadaver the effects of position of the head and neck when making artificial respiration. Through the open vault of the skull the epiglottis could be seen, rising from its position and allowing the larynx to remain open when the neck was extended and the chin depressed, showing that the usual method of merely throwing the head back was a faulty one.

Also Dr. T. H. Manley, with oral description and the use of diagrams, demonstrated the O'Hara, or Australian, method of the radical cure of hernia. The value of this form of operation consists in the completeness of the closure and the smallness of the resulting scar.

The presentation by Dr. Landes of a patient who had been successfully operated on for abscess of the liver, and by Dr. Everett W. Russell of a patient with chancre of the tongue. These complete the list of cases and demonstrations.



At the annual meeting January, 1895, the following officers were chosen :

President—DR. S. B. W. McLEOD.  
 Vice-President—DR. A. D. RUGGLES.  
 Recording Secretary—DR. P. BRYNBERG PORTER.  
 Corresponding Secretary—DR. N. G. BOZEMAN.  
 Treasurer—DR. JOHN H. HINTON.  
 Member of Executive Committee—DR. THOMAS H. BURCHARD.

At the meeting February, 1895, the annual address of the president was delivered by Dr. S. B. W. McLeod, subject, "The Place of Influence of the Medical Profession in the Progress of Civilization." Believing that the purpose of the presidential address is accomplished when delivered to those most interested, viz., the members present at the meeting, no further comment is deemed necessary.

"The Annual Register and Manual of Information for 1895" has been published, and promptly distributed. It is a volume larger than any of its predecessors in the series.

The Association continues to increase in numbers, and maintains the good attendance at monthly meetings reported in former years. At the close of June, 1895, the number of members was one thousand and fifty-six (1,056).

Without eulogy, but with unfeigned sorrow, the following simple record will tell us of those who have died during the year just closed :

Dr. John A. Naughton, November 17, 1894.  
 Dr. William Detmold, December 26, 1894.  
 Dr. Henry Goldthwaite, January 3, 1895.  
 Dr. Joseph S. Fitzgerald, January 7, 1895.  
 Dr. Stephen W. Roof, January 9, 1895.  
 Dr. Gustav Frauenstein, February 27, 1895.  
 Dr. Matthew D. Field, March 8, 1895.  
 Dr. John Marshall Hawkes, May 26, 1895.  
 Dr. Michael C. Redmond, July 26, 1895.  
 Dr. Fred. M. Warner, October 9, 1895.

Desiring to contribute alike to the benefit of the County Association, whose report is thus offered, and to the State Association, to whom it is made, the writer respectfully presents it for consideration.

S. B. W. McLEOD, *President.*

# PROCEEDINGS.

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## TWELFTH ANNUAL MEETING

OF THE

### NEW YORK STATE MEDICAL ASSOCIATION,

HELD AT THE MOTT MEMORIAL HALL, 64 MADISON AVENUE, NEW  
YORK CITY, OCTOBER 15, 16, AND 17, 1895.

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FIRST DAY, OCTOBER 15.

#### MORNING SESSION.

The meeting was called to order at 10:30 a. m., by the PRESIDENT, DR. AUSTIN FLINT.

The report of the Committee of Arrangements was presented by the Chairman, DR. CHARLES E. DENISON, and on motion, the report was accepted and adopted.

The Annual Report of the Council was then read by the SECRETARY.

On motion, the report was accepted and adopted.

The PRESIDENT appointed the following Committee on Treasurer's Accounts :

DR. W. H. ROBB.  
DR. A. T. VAN VRANKEN.  
DR. S. B. W. McLEOD.

The question of adopting the proposed Amendment to the Constitution, as published in Vol. IX, page 776 and page 777, then came up.

Its object is to secure a larger membership in the Association, and to this end it is proposed to strike out that portion giving to delegates from the County Associations the power to vote.

DR. E. D. FERGUSON moved the adoption of the Amendment. Seconded.

DR. S. B. W. McLEOD, of New York County: What is the advantage of being a delegate from the County Association?

DR. FERGUSON: It gives them representation in the American Medical Association, and entitles them to receive the Transactions and to participate in everything except the business proceedings.

DR. McLEOD: I should doubt the policy of depriving them of voting, and I think it would be perfectly safe to leave it as it is. I am sure that a strong majority of the County Association wish for the success of the State Association. Again, there are at least ten residents of the County of New York who are members of the State Association, but not members of the County Association. I would hesitate about the adoption of the amendment. We expect this year to be entitled to one hundred or more delegates to the State Association.

DR. J. W. S. GOULEY, of New York County: I am sure the State Association would be happy to grant all reasonable privileges to the County Association. However, it would be a great injustice to the members of the Association who pay their annual dues to admit a number of voting delegates who pay no dues. I do not see that we can do more than is provided for in this amendment to the constitution. The great object of the County Association is to send delegates to the American Medical Association. Now, to receive delegates here, and permit them to decide questions for us when these delegates do not occupy the same position as the members, would be manifestly unjust and wrong. I, therefore, hope that the resolution as proposed by the SECRETARY, will pass unanimously. It is understood that the delegates will be supplied with copies of the Transactions at the cost to the regular members, and I consider this in itself a great concession.

DR. J. G. TRUAX, of New York County: I think there can be but one opinion, viz.: that a man cannot have the full privileges of membership unless he pays the same price as the members.

A rising vote was then taken. The amendment was declared adopted.

The reports of the various District Associations were then read by title.

#### AFTERNOON SESSION.

The meeting was called to order by the Vice-President, DR. C. M. KLOCK.

The Secretary announced the appointment of the following Nominating Committee :

First District, DOUGLAS AYRES and J. P. SHARER.  
 Second District, A. T. VAN VRANKEN and E. D. FERGUSON.  
 Third District, F. G. SEAMAN and H. D. DIDAMA.  
 Fourth District, W. H. THORNTON and Z. J. LUSK.  
 Fifth District, JOSEPH D. BRYANT and J. DWYER.  
 At large, J. W. S. GOULEY.

The reading and discussion of papers followed.

On motion, the Association adjourned at 4:15 p. m.

### EVENING SESSION.

This was devoted to the reading and discussion of scientific papers.

## SECOND DAY, OCTOBER 16.

### MORNING SESSION.

The meeting was called to order by the PRESIDENT.

DR. THOMAS H. MANLEY, of New York County: In justice to myself and to the Association of which it was my privilege to be one of the Founders, I desire to present a matter for your consideration. A gross outrage has been permitted by the colleges or teaching faculties in this County of New York, which I trust will receive the consideration of the Association. It is not only this one fact, but the principle involved, which I understand is to be extended to all the public hospitals. For nearly twenty years I have done faithful and gratuitous work in a hospital here, and yet without any pretense of a charge against me, I am removed. I do not speak for myself alone, but for the principle involved. I therefore present the following preambles and resolution :

WHEREAS, As the action of the Bellevue Hospital Medical College and the University Medical College in the late re-organisation of the Harlem Hospital medical staff, whereby members of the said staff were displaced without charges of any description having been preferred against them, after years of faithful and gratuitous service, has seemed in wide contravention to the spirit of the Code, and

WHEREAS, This action is quite without precedent, and involves a principle which concerns the entire profession, and has imposed an injustice on members of this Association ; therefore be it

*Resolved*, That the Council of the New York State Medical Association be instructed to institute a searching investigation into this transaction, and report their conclusion thereon before this annual meeting adjourns.

DR. E. D. FERGUSON moved that the matter be referred to the Council of the Association, with power. Seconded and carried.

The Association adjourned at 12:30 p. m.

#### AFTERNOON SESSION.

The meeting was called to order by the PRESIDENT at 1:45 p. m.

The session was devoted to scientific business, and the meeting adjourned at 5:30 p. m.

#### EVENING SESSION.

The evening was devoted to the delivery of the PRESIDENT'S Address, and to a collation.

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### THIRD DAY, OCTOBER 17.

#### MORNING SESSION.

The meeting was called to order by the Vice-President, DR. KLOCK, at 10 a. m.

The report of the Nominating Committee was then read as follows :

President—DARWIN COLVIN.

Vice-President, First District—C. H. GLIDDEN.

Member of Council, First District—W. H. ROBB.

Vice-President, Second District—THOMAS WILSON.

Member of Council, Second District—GEORGE E. McDONALD.

Vice-President, Third District—F. G. SEAMAN.

Member of Council, Third District—W. L. AYER.

Member of Council, Fourth District—E. M. MOORE.

Vice-President, Fifth District—J. R. VANDERVEER.

Member of Council, Fifth District—JOHN D. TRUAX.

Secretary and Treasurer—E. D. FERGUSON.

[Signed]

H. D. DIDAMA, *Chairman*.

W. H. THORNTON, *Secretary*.



On motion of Dr. Z. J. LUSK, the report was accepted and adopted.

The following Delegate's report was presented :

October 14, 1895.

*To New York State Medical Association :*

MR. PRESIDENT : Agreeable to the appointment I have attended as the delegate from the New York State Medical Association the meetings of the Rhode Island Medical Society and also the meeting of the Massachusetts Medical Society and have the pleasure to report as follows :

The Rhode Island Medical Society held quarterly meetings in Providence of which your Delegate attended three. The annual meeting was held on June 6, 1895, on which occasion Dr. ELISHA P. CLARK of Hope Valley, R. I., was elected President and also a new Secretary, Dr. FRANK L. DAY of Providence. Scientific papers have been read and ably discussed. An act has passed the Legislature to "regulate the practise of medicine in the State of Rhode Island", which is in active operation since July 16, 1895. Thanks to the energetic action of Dr. GARDNER T. SWARTS, the efficient secretary of the State Board of Health of Rhode Island, that law has been executed and all regular physicians have been registered.

The Massachusetts Medical Society celebrated its one hundred and fourteenth anniversary on June 11 and 12, 1895, in Mechanics Building, Boston. The meeting was well attended, many scientific papers were read and a large banquet given at which the governor of Massachusetts was present and addressed the members. The different large halls in the building were utilized for different exhibitions, and one feature was a drill of the ambulance corps belonging to the National Guard of Massachusetts. A pleasant culmination of the anniversary was a steamboat excursion down the Boston harbor by invitation of the Boston Board of Health. Landings were made on Moon Island for inspection of the sewer outfall, also the quarantine and antitoxine station. One part of the excursionists went to the pumping works, Dorchester. The meeting was a scientific as well as social success.

All of which is respectfully submitted :

ROBERT NEWMAN, M. D.

The committee on TREASURER'S Accounts reported that they had examined the same, and found them correct,

The reading of papers was then taken up.

The Association adjourned at 11:45 a. m.

#### AFTERNOON SESSION.

The meeting was called to order by the PRESIDENT at 2 p. m.

DR. GOULEY moved that the Council be instructed to appoint a committee to confer with a similar committee to be appointed by

the President of the Prison Association ; and that it should report on the subject of criminology at the next regular meeting of this Association. Seconded. Carried.

THE PRESIDENT. DR. FLINT: I congratulate the Association on the fidelity with which the programme has been carried out. After I have had the honour to present to you DR. DARWIN COLVIN, my successor, whose administration will make you forget my defects, I shall adjourn the Association *sine die*.

DR. DARWIN COLVIN, of Wayne County: It is no time to make a long speech, and I shall not do so, but it is my duty to thank you for calling upon me to discharge the duties of your President; and for that partiality I am deeply thankful. I cannot hope to discharge them as well as my distinguished predecessor, but I shall endeavour to do, as far as is in my power, whatever shall add to the interest and the progress of this Association. Again, let me assure you of my appreciation of this honour.

At 3:30 p. m. the Association adjourned *sine die*.

E. D. FERGUSON, *Secretary*.

ANNUAL REPORT OF THE COUNCIL  
AND  
MINUTES OF THE SESSIONS OF THE COUNCIL,  
FOR THE YEAR 1895.

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The Council met for its twelfth annual session at No. 16 Gramercy Park, New York city, on Monday evening, October 14, 1895.

The session opened at 9 p. m.

Present: The President, Dr. Austin Flint, and Drs. Bryant, Denison, Ferguson, Glidden, Gouley, Klock, Putnam, Seaman, Truax, Van Vranken.

The Secretary reported the following list of applicants for Fellowship, the applications being duly approved in each instance, viz.: William Carr, Edward B. Dench, Henry McM. Painter, Alexander A. Smith, Edwin J. Gravatte, Henry W. Johnson, C. S. Parkhill, Frederick A. Smith, James E. Walker, George Condermann, L. O. Eastman, Jack Killen, F. M. Michael, Edward L. Smith, James M. Sweeney, Benjamin W. Stearns, William A. White, R. Harcourt Anderson, George D. Stuart.

The Secretary presented the

*Report of the Committee on Publications.*

The Committee on Publications have to report that an edition of one thousand copies of Volume 11 has been printed, bound, and distributed to those entitled to receive copies. The volume consists of 759 printed pages, and is believed to be equal to any volume in the series, both in matter and workmanship.

In the distribution of the volumes, an unfortunate event occurred: The printing-house gave the distributing list to one of its employees for the purpose of delivering the volumes, and the same employee reported that the volumes had been sent, but enquiries from Fellows entitled to volumes stating that they had not received their copies, showed that some fault in the distribution existed. Upon

investigation, it was learned that the person who had charge of the distribution, and who had previously been accurate and prompt in the discharge of his duties, had recently been worshipping at the shrine of Bacchus—with the result that only a small portion of the list had received attention, though a complete distribution had been reported. After considerable work and delay, the error was corrected.

The total cost of the edition, together with distribution charges for the volumes sent from Concord, was \$1,383.88, being only \$53.59 more than the cost of Volume 10, though the volume contains 166 additional pages.

[Signed] E. D. FERGUSON,  
*Chairman and Editor.*

The report was accepted.

The Treasurer then reported as follows :

#### NEW YORK STATE MEDICAL ASSOCIATION.

#### ANNUAL REPORT OF THE TREASURER FROM OCTOBER 1, 1894, TO OCTOBER, 1895.

##### RECEIPTS—GENERAL FUND.

Balance from last report, . . . . .	\$2,512.01	
Dues, . . . . .	2,260.00	
Initiation, . . . . .	115.00	
Sale of Transactions, . . . . .	3.00	
Interest, . . . . .	70.00	
	<hr/>	\$4,960.01

##### DISBURSEMENTS.

Sundries, including expenses of Trans-		
actions, . . . . .	\$1,946.75	
Postage stamps, . . . . .	96.00	
Express and freight, . . . . .	55.81	
	<hr/>	\$2,098.56
Balance in General Fund, October 1, 1895,		\$2,861.45

##### LIBRARY AND BUILDING FUND.

Amount at last report, . . . . .	\$2,738.91	
Interest, . . . . .	94.50	
	<hr/>	\$2,833.41
Total funds in treasury, October 1, 1895,		\$5,694.86

This report shows a net increase in the funds of the Association of \$443.94.

[Signed] E. D. FERGUSON, *Treasurer.*

The report was accepted.

[The following action was had in the sessions of the Association:

NEW YORK, October 16, 1895.

The undersigned, the committee to examine the accounts of the Treasurer, report that they find the report correct.

[Signed] W. H. ROBB,  
A. T. VAN VRANKEN,  
S. B. W. McLEOD,  
*Committee.]*

The Secretary then presented the following

MEMORANDA.

There has arisen a practical question concerning membership in the State Association and the Branch Associations, on which the Secretary has a clearly defined opinion, but there has been no formal action by the Council, and it seems proper that a guide should be established by resolution. The question involved is as to whether a member can resign from a Branch, and still be in Fellowship in the State Association. The Secretary is of the opinion that no member can resign from a Branch without that act severing his membership in the state organisation. The ground for this conclusion is the fact that the Branches are constituted and consist of the several members of the State Association residing in certain geographical divisions of the state, and, by implication, to be a member of the parent body implies a membership in one of the Branches.

The only question in doubt would be as to whether a resignation from the Branch should be held as having any force. The judgment of the Secretary is that if accepted by the Branch, and the person being clear on the Treasurer's books for both bodies, then the resignation should be considered as severing connection with the State Association as well as the Branch.

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The Secretary was one of the delegation that attended the meeting of the American Medical Association held at Baltimore in May, of this year, and he is glad to report that the sympathy of the



national organisation was apparently very strong in favour of all the objects in which our state Association is interested. It is also proper to express the hope that a large delegation will attend the meeting at Atlanta, in May, 1896, and contribute by their presence, and by participation in the scientific work, to the growth and usefulness of the National Association. It should be constantly kept in mind that membership in our American Medical Association is open to all members of the State Association, but that only delegates can take part in the business affairs.

The Secretary calls attention to the fact that he has served the Association for twelve years, and ventures to express the hope that a successor may be found for him at this annual election. Too long a service is liable to result in the incumbent falling into a routine, the breaking of which may be of use to the organisation.

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On motion, it was resolved that a resignation received by the Secretary of a Branch Association, shall be forthwith forwarded to the Secretary of the State Association.

The Chairman of the Library Committee then presented the

*Eleventh Annual Report of the Library Committee of the New York State Medical Association.*

*October 14, 1895.*

The Library Committee has the honour to present the eleventh annual report on the library of the Association, which shows an increase of 277 volumes over the last report. On October 8, 1894, the number of volumes in the library was 9,226. Since that date, 277 volumes were received, making a total of 9,503 volumes. Of the 277 volumes, received during the year ending October 1, 1895, 251 were contributed by Mr. Bradish J. Carroll, from the library of his father,—our lamented Fellow, Doctor Alfred L. Carroll. The Transactions of many State Medical Societies were also received, in exchange for the Transactions of this Association, and the last volume of the Index Catalogue of the library of the Surgeon-General United States Army. Medical journals and pamphlets are periodically sent by publishers and authors. During the current year, 167 visits were made to the library by Fellows of the Association, other physicians, medical students, and laymen.

J. W. S. GOULEY, M. D.,

*Director of the Library and Chairman of the Committee.*

The report was accepted and adopted.

On motion, the Secretary was authorised to subscribe for one copy of the *Index Medicus* for the library.

There being no further business, the Council adjourned.

[Signed] E. D. FERGUSON, *Secretary*.

The Council for 1895-'96 met on adjournment of the Association, and the Chairman announced that he had appointed Dr. Austin Flint as member of the Council at-large.

There were present : The Chairman, Dr. Colvin, and Drs. Ferguson, Flint, Gouley, Klock, Seaman, and Truax.

On motion, the members of the Council in the Fifth District were constituted a Committee of Arrangements, with Dr. Truax as Chairman, and with power to add to their number.

The Treasurer was directed to pay one hundred dollars to the Mott Memorial Library, in addition to the one hundred dollar annual payment.

The next annual meeting was fixed for Tuesday, October 13, 1896.

On motion, the resolution of Dr. Manley, referred to the Council by the Association, was referred to the President for investigation, and a report at the annual meeting of the Council.

On motion, the members of the Council, for the Second District, were constituted the Committee on Publications, with the Secretary as Chairman and Editor.

In connection with the resolution of Dr. Gouley, in the General session, the Chairman appointed Drs. Flint, W. A. White, and Gouley as the Committee on Criminology.

The following applicants were appointed Fellows, viz.,—

Arthur G. Bennett, George W. Clark, Edgar H. Douglas, Thomas Kelly, William Scott Muir (non-resident), Francis Peele, Albert Reed, Sidney Yankauer.

On motion, the Council adjourned.

[Signed] E. D. FERGUSON, *Secretary*.

# LIST OF FELLOWS.

BY DISTRICT AND COUNTY.

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## FIRST OR NORTHERN DISTRICT.

### FRANKLIN COUNTY.

Founder. \*Gillis, William. Fort Covington.

1

### FULTON COUNTY.

Original. Blake, Clarence R. Northville.

Founder. \*de Zouche, Isaac. Gloversville.

Drake, D. Delos. Johnstown.

Edwards, John. Gloversville.

4

### HAMILTON COUNTY.

McGann, Thomas. Wells.

1

### HERKIMER COUNTY.

Casey, J. E. Mohawk.

Douglass, A. J. Ilion.

Douglas, Edgar H. Little Falls.

Garlock, William D. Little Falls.

Original. Glidden, Charles H. Little Falls.

Greene, H. H. Paine's Hollow.

Original. Potter, Vaughan C. Starkville.

Original. Sharer, John P. Little Falls.

Original. Southworth, Mark A. Oakland, Cal.

Original. Young, John D. Starkville.

10

\* Deceased.

## JEFFERSON COUNTY.

Founder. Crowe, J. Mortimer. Watertown.  
Original. Johnson, Parley H. Adams.

2

## LEWIS COUNTY.

Crosby, Alexander H. Lowville.  
Douglass, Charles E. Lowville.  
Joslin, Albert A. Martinsburgh.  
Kelley, John D. Lowville.

4

## MONTGOMERY COUNTY.

Original. Ayers, Douglas. Fort Plain.  
Caldwell, Nathan A. Hageman's Mills.  
French, S. H. Amsterdam.  
Original. Graves, Ezra. Amsterdam.  
Original. Johnson, Richard G. Amsterdam.  
Klock, Charles M. St. Johnsville.  
Original. Leach, H. M. Charlton City, Mass.  
Meyer, George L. Stone Arabia.  
Parr, John. Buell.  
Parsons, W. W. D. Fultonville.  
Founder. Robb, William H. Amsterdam.  
Simons, Frank E. Canajoharie.  
Smyth, Arthur V. H. Amsterdam.

13

## ONEIDA COUNTY.

Armstrong, James A. Clinton.  
Original. Bagg, Moses M. Utica.  
Barnum, D. Albert. Cassville.  
Original. Blumer, G. Alder. Utica.  
Bond, George F. M. Utica.  
Original. Booth, Wilbur H. Utica.  
Original. Brush, Edward N. Towsen, Md.  
Churchill, Alonzo. Utica.  
Clarke, Wallace. Utica.  
Dodge, Amos P. Oneida Castle.

- Douglass, James W. Booneville.  
 Ellis, J. B. Whitesborough.  
 English, G. P. Booneville.  
 Fitzgerald, John F. Rome.  
 Flandrau, Thomas M. Rome.  
 Fraser, Jefferson C. Ava.  
 Fuller, Earl D. Utica.  
 Gibson, William M. Utica.  
 Holden, Arthur L. Utica.  
 Hughes, Henry R. Clinton.  
 Original. Hunt, James G. Utica.  
 Kuhn, William. Rome.  
 Munger, Charles. Knoxboro.  
 Nelson, William H. Taberg.  
 Nold, John B. Utica.  
 Palmer, Henry C. Utica.  
 Palmer, Walter B. Utica.  
 Phelps, George G. Utica.  
 Founder. Porter, Harry N. Washington, D. C.  
 Reid, Christopher C. Rome.  
 Russell, Charles P. Utica.  
 Scully, Thomas P. Rome.  
 Sutton, H. C. Rome.  
 Sutton, Richard E. Rome.  
 Swartwout, Leander. Prospect.  
 Sweeny, James M. Utica.  
 Tefft, Charles B. Utica.  
 West, Joseph E. Utica.

## OSWEGO COUNTY.

- Bacon, Charles G. Fulton.  
 Bates, Nelson W. Central Square.  
 Cooley, F. L. Oswego.  
 Cooley, R. N. Hannibal Centre.  
 Original. DeWitt, Byron. Oswego.  
 Huntington, John W. Mexico.  
 Johnson, George P. Mexico.  
 Marsh, E. Frank. Fulton.  
 Todd, John P. Parish.



## ST. LAWRENCE COUNTY.

Cook, Guy Reuben. Louisville.

1

## SECOND OR EASTERN DISTRICT.

## ALBANY COUNTY.

Abrams, H. C. Newtonville.

Founder. Bailey, Theodore P. Albany.

Haynes, John U. Cohoes.

Founder. Peters, Samuel. Cohoes.

Rulison, L. B. West Troy.

Founder. Sabin, William B. West Troy.

Original. Van Vranken, Adam T. West Troy.

Whitbeck, Charles E. Cohoes.

Zeh, Merlin J. West Troy.

9

## CLINTON COUNTY.

Founder. Dodge, Lyndhurst C. Rouse's Point.

Holcomb, O. A. Plattsburgh.

Founder. Lyon, E. M. Plattsburgh.

3

## COLUMBIA COUNTY.

Original. Benham, John C. Hudson.

Bradley, O. Howard. Hudson.

Clum, Franklin D. Cheviot.

Fritts, Crawford Ellsworth. Hudson.

Johnson, Henry W. Hudson.

Original. Lockwood, J. W. Philmont.

Original. Smith, H. Lyle. Hudson.

Vedder, George W. Philmont.

Wheeler, John T. Chatham.

Founder. Wilson, Thomas. Claverack.

Woodruff, R. Allen. Philmont.

Woodworth, T. Floyd. Kinderhook.

12

ESSEX COUNTY.

- Founder.    Barton, Lyman.    Willsborough.  
               Barton, L. G.    Willsborough.  
               Church, Charles A.    Bloomingdale.  
 Original.    D'Avignon, Francis J.    Au Sable Forks.  
 Original.    LaBell, Martin J.    Lewis.  
 Original.    Riley, Andrew W.    Au Sable Forks.  
 Original.    Robinson, Ezra A.    Jay.  
 Original.    Turner, Melvin H.    Moriah.

8

GREENE COUNTY.

- Original.    Conkling, George.    Durham.  
               Getty, A. H.    Athens.  
               Huestis, W. B.    Kiskatom.  
 Original.    \*Selden, O. G.    Catskill.  
 Original.    Selden, Robert.    Catskill.

5

RENSSELAER COUNTY.

- Original.    Allen, Amos.    Grafton Centre.  
 Founder.    Allen, Charles S.    Greenbush.  
               Allen, William L.    Greenbush.  
               Baynes, Joseph E.    Troy.  
               Bissell, James H.    Troy.  
               Bonesteel, H. F.    Troy.  
 Founder.    Bonesteel, William N.    Troy.  
 Original.    Bontecou, Reed B.    Troy.  
               Boyce, Elias B.    Averill Park.  
 Founder.    Burbeck, Charles H.    Troy.  
               Burton, Henry B.    Troy.  
 Founder.    \*Burton, Matthew H.    Troy.  
               Cahill, John T.    Hoosick Falls.  
               Church, Thomas C.    Valley Falls.  
 Original.    Cooper, William C.    Troy.  
               Crounse, Andrew C.    Melrose.  
               Dickinson, M. D.    Troy.  
               Dickson, Thomas Gordon.    Troy.  
 Founder.    Ferguson, E. D.    Troy.

\* Deceased.

- Founder. Finder, William. Troy.  
 Gravatte, Edwin J. Troy.  
 Greenman, C. E. Troy.  
 Founder. Hannan, James C. Hoosick Falls.  
 Hannan, Thomas H. Hoosick Falls.  
 Founder. Harvie, J. B. Troy.  
 Original. Heimstreet, Thomas B. Troy.  
 Original. Houston, David W. Troy.  
 Hutton, M. B. Valley Falls.  
 Keith, Halbert Lyon. Upton, Mass.  
 Original. Lyon, George E. St. Louis, Mo.  
 Lyons, Edward L. Troy.  
 Original. Magee, Daniel. Troy.  
 Marsh, James P. Troy.  
 Morehouse, E. W. Troy.  
 Founder. Nichols, Calvin E. Troy.  
 Founder. Nichols, William H. West Sand Lake.  
 Phelan, Michael F. Troy.  
 Original. Rogers, S. Frank. Troy.  
 Founder. Rousseau, Zotique. Troy.  
 Founder. Seymour, W. Wotkyns. Troy.  
 Original. Skinner, Smith A. Hoosick Falls.  
 Smith, Frederick A. Troy.  
 Tompkins, Fred J. Lansingburgh.  
 Original. \*Traver, Richard D. Troy.  
 Ward, R. H. Troy.

45

## SARATOGA COUNTY.

- Allen, Henry J. Corinth.  
 Founder. Comstock, George F. Saratoga Springs,  
 Original. Crombie, Walter C. Mechanicsville.  
 Curtis, P. C. Round Lake.  
 Original. Dunlop, John J. Waterford.  
 Gow, Frank F. Schuylerville.  
 Founder. Grant, Charles S. Saratoga Springs.  
 Original. Hall, William H. Saratoga Springs.  
 Founder. Hodgman, William H. Saratoga Springs.  
 Hudson, George. Stillwater.  
 Humphrey, J. F. Saratoga Springs.

\* Deceased.

- Inlay, Erwin G. Saratoga Springs.
- Original. Johnson, Ianthus G. Greenfield Centre.
- Keefer, Charles W. Mechanicsville.
- Kniskern, A. C. Mechanicsville.
- Moriarta, D. C. Saratoga Springs.
- Original. Murray, Byron J. Saratoga Springs.
- Palmer, F. A. Mechanicsville.
- Parent, J. S. Birchton.
- Original. Preston, John R. Schuylerville.
- Founder. Reynolds, Tabor B. Saratoga Springs.
- Sherer, John D. Waterford.
- Sherman, F. J. Ballston.
- Smith, F. A. Corinth.
- Original. Stubbs, Roland H. Waterford.
- Swan, William E. Saratoga Springs.
- Swanick, A. A. Saratoga Springs.
- Sweetman, J. T., Jr. Ballston.
- Thompson, Amos W. Saratoga Springs.
- Varney, Miles E. Saratoga Springs.
- Webster, W. B. Schuylerville.
- Zeh, Edgar. Waterford.

## SCHENECTADY COUNTY.

- Hammer, Charles. Schenectady.
- Original. McDonald, George E. Schenectady.
- McDougall, R. A. Duaneburgh.
- Original. Reagles, James R. Schenectady.
- Original. Van Zandt, Henry C. Schenectady.
- Veeder, Andrew T. Pittsburg, Pa.

## SCHOHARIE COUNTY.

- Original. Hagadorn, William. Gilboa.
- Original. Kingsley, Henry F. Schoharie.

## WARREN COUNTY.

- Fitzgerald, David J. Glens Falls.

Original. Martine, Godfrey R. Glens Falls.  
 Montgomery, J. J. Luzerne.

3

## WASHINGTON COUNTY.

Lambert, John. Salem.  
 Long, Alfred J. Whitehall.

2

## THIRD OR CENTRAL DISTRICT.

## BROOME COUNTY.

Allen, S. P. Whitney's Point.  
 Founder. Chittenden, Joseph H. Binghamton.  
 Dudley, Dwight. Maine.  
 Eastman, L. O. Union.  
 Original. Ely, Henry Oliver. Binghamton.  
 Farnham, LeRoy D. Binghamton.  
 Farrington, John M. Binghamton.  
 Forker, Frederick L. Binghamton.  
 Greene, Clark W. Binghamton.  
 Guy, J. D. Chenango Forks.  
 Original. Hills, Lyman H. Binghamton.  
 Hough, F. P. Binghamton.  
 Killen, Jack. Binghamton.  
 Knapp, W. H. Union Centre.  
 Meacham, Isaac D. Binghamton.  
 Michael, F. M. Binghamton.  
 Moore, William A. Binghamton.  
 Founder. Orton, John G. Binghamton.  
 Pierce, Edward A. Binghamton.  
 Pierson, G. E. Kirkwood.  
 Place, John F., Jr. Binghamton.  
 Founder. Putnam, Frederick W. Binghamton.  
 Original. Race, W. F. Kearney, Neb.  
 Founder. Richards, Charles B. Binghamton.  
 Rodgers, Harris C. Binghamton.  
 Seymour, Ralph A. Whitney's Point.  
 Slater, Frank Ellsworth. Binghamton.



Smith, Edward L. Binghamton.

Wells, E. H. Binghamton.

White, William A. Binghamton.

30

#### CAYUGA COUNTY.

Original. Kenyon, M. Moravia.

Original. Laird, William R. Auburn.

Founder. Sawyer, Conant. Auburn.

Original. Tripp, John D. Auburn.

Woodruff, E. Gould. Auburn.

5

#### CHEMUNG COUNTY.

Original. Brown, Charles W. Washington, D. C.

Drake, E. G. Elmira.

Original. Ross, Frank W. Elmira.

Squires, Charles L. Elmira.

Original. Wales, Theron A. Elmira.

5

#### CHENANGO COUNTY.

Original. Blair, Louis P. McDonough.

Original. Brooks, Leroy J. Norwich.

Copely, Herman D. Bainbridge.

Douglas, George. Oxford.

Hand, S. M. Norwich.

Hayes, Philetus A. Afton.

Original. Johnson, Leonard M. Greene.

Original. Lyman, H. C. Sherburne.

Noyes, James B. New Berlin.

Packer, Thurston G. Smyrna.

Smith, Samuel L. Smithville.

Thompson, R. A. Norwich.

Van Wagner, L. A. Sherburne.

Williams, George O. Greene.

14

#### CORTLAND COUNTY.

Bradford, George D. Homer.

Original. Clark, DeWitt. Marathon.

- Didama, E. A. Cortland.  
 Halbert, M. L. Cincinnatus.  
 Founder. Hendrick, Henry C. McGrawville.  
 Higgins, F. W. Cortland.  
 Founder. Jewett, Homer O. Cortland.  
 Kenyon, Benjamin. Cincinnatus.  
 Reese, Frank D. Cortland.

9

## DELAWARE COUNTY.

- Drake, James B. Hancock.  
 Morrow, William B. Walton.  
 Smith, George C. Delhi.  
 Travis, Edward M. Eagle Grove, Ia.

4

## MADISON COUNTY.

- Original. Birdsall, Gilbert. N. Brookfield.  
 Burhyte, O. W. Brookfield.  
 Cavana, Martin. Oneida.  
 Original. Carpenter, Henry W. Oneida.  
 Drake, Frank C. Oneida.  
 Huntley, James F. Oneida.  
 Miles, George W. Oneida.  
 Original. Nicholson, A. R. Madison.

8

## ONONDAGA COUNTY.

- Original. Aberdein, Robert. Syracuse.  
 Brown, Ulysses H. Syracuse.  
 Campbell, A. J. Syracuse.  
 Founder. Dallas, Alexander J. Syracuse.  
 Founder. Didama, Henry D. Syracuse.  
 Original. Donohue, Florence O. Syracuse.  
 Earle, George W. Tully.  
 Original. Edwards, Amos S. Syracuse.  
 Original. Edwards, George A. Syracuse.  
 Flanagan, John R. Syracuse.  
 Original. Hatch, C. A. Syracuse.  
 Founder. Head, Adelbert D. Syracuse.

- Original. Jacobson, Nathan. Syracuse.  
 Founder. Kneeland, Jonathan. South Onondaga.  
           Magee, Charles M. Syracuse.  
 Original. McNamara, Daniel. Syracuse.  
 Original. Munson, W. W. Otisco.  
 Founder. Parsons, Israel. Marcellus.  
 Original. Saxer, Leonard A. Syracuse.  
           Sears, F. W. Syracuse.  
 Founder. Van de Warker, Ely. Syracuse.  
 Original. Whitford, James. Onondaga Valley.

22

#### OTSEGO COUNTY.

- Original. Barney, C. S. Milford.  
           Church, B. A. Oneonta.  
           Ford, M. L. Oneonta.  
 Founder. Leaning, John K. Cooperstown.  
 Original. Martin, John H. Otego.  
 Original. Merritt, George. Cherry Valley.  
 Original. \*Sweet, Joseph Unadilla.  
           Sweet, Joshua J. Unadilla.

8

#### SCHUYLER COUNTY.

- King, James K. Watkins.  
 Roper, P. B. Alpine.  
 Leffingwell, E. D. Watkins.  
 Smelzer, Baxter T. Havana.

4

#### SENECA COUNTY.

- Bellows, George A. Waterloo.  
 Blaine, Myron D. Willard.  
 Clark, George W. Waterloo.  
 Founder. Lester, Elias. Seneca Falls.  
           Seaman, Frank G. Seneca Falls.  
           Welles, S. R. Waterloo.

6

\* Deceased.

## TIOGA COUNTY.

Original. Ayer, W. L. Owego.  
Cady, George M. Nichols.

2

## TOMPKINS COUNTY.

Founder. Beers, John E. Danby.  
Biggs, Chauncey P. Ithaca.  
Flickinger, John. Trumansberg.

3

## FOURTH OR WESTERN DISTRICT.

## ALLEGHANY COUNTY.

Original. Wakely, Benjamin C. Angelica.

1

## CATTARAUGUS COUNTY.

Eddy, John L. Olean.  
Ellsworth, Victor A. Boston, Mass.  
Lake, Albert D. Gowanda.  
Mudge, Selden J. Olean.  
Original. Tompkins, Orrin A. East Randolph.

5

## CHAUTAUQUA COUNTY.

Founder. Ames, Edward. Kalamazoo, Mich.  
Bemus, Morris N. Jamestown.  
Bemus, William Marvin. Jamestown.  
Founder. Dean, Harmon J. Brocton.  
Richmond, Nelson G. Fredonia.  
Rolph, R. T. Fredonia.  
Founder. Strong, Thomas D. Westfield.

7

## ERIE COUNTY.

Andrews, Charles H. Holland.  
Original. Atwood, H. L. Collins Centre.

- Original. Banta, Rollin L. Buffalo.
- Original. Bartlett, Frederick W. Buffalo.  
Bennett, Arthur G. Buffalo.  
Bergtold, W. H. Buffalo.
- Original. Boies, Loren F. East Hamburg.
- Original. Briggs, Albert H. Buffalo.  
Brooks, Mark N. Springville.  
Brown, George L. Buffalo.  
Bryant, Percy. Buffalo.  
Burghardt, Francis Augustus. Buffalo.  
Clendenan, C. W. N. Tonawanda.  
Cohen, Bernard. Buffalo.  
Congdon, Charles E. Buffalo.  
Cooke, Almon H. Buffalo.
- Founder. Cronyn, John. Buffalo.
- Original. Dagenais, Alphonse. Buffalo.
- Original. Daniels, Clayton M. Buffalo.  
Dayton, C. L. Buffalo.
- Original. Dorland, Elias T. Buffalo.  
Fell, George E. Buffalo.  
Fowler, Joseph. Buffalo.  
Frederick, Carlton C. Buffalo.  
Gould, Cassius W. Buffalo.  
Green, Stephen S. Buffalo.
- Original. Greene, DeWitt C. Buffalo.
- Founder. Greene, Joseph C. Buffalo.
- Original. Greene, Walter D. Buffalo.
- Original. Harrington, D. W. Buffalo.  
Hartwig, Marcell. Buffalo.  
Hayd, Herman E. Buffalo.  
Heath, William H. Buffalo.  
Himmelsbach, George A. Buffalo.  
Howard, Charles F. Buffalo.
- Founder. Hoyer, F. F. Tonawanda.  
Hubbell, Alvin A. Buffalo.  
Hunt, H. L. Orchard Park.  
Ingraham, Henry D. Buffalo.  
Jackson, William H. Springville.
- Original. Johnson, Thomas M. Buffalo.  
Jones, Allen A. Buffalo.  
Lapp, Henry. Clarence.  
Long, Ben D. Buffalo.



- McFarlane, William A. Springville.
- Original. Murray, William D. Tonawanda.  
Park, Roswell. Buffalo.
- Original. Pettit, John A. Buffalo.  
Phelps, William C. Buffalo.  
Pohlman, Julius. Buffalo.  
Rochester, DeLancy. Buffalo.  
Stockton, Charles G. Buffalo.  
Strong, Orville C. Colden.  
Taber, R. C. Tonawanda.  
Thornton, William H. Buffalo.
- Founder. Tremaine, William S. Buffalo.  
Trull, H. P. Williamsville.  
Twohey, John J. Buffalo.  
Wall, Charles A. Buffalo.  
Wheeler, Isaac G. Marilla.  
Whipple, Electa B. Buffalo.  
Willoughby, M. Buffalo.
- Founder. Wyckoff, Cornelius C. Buffalo.

63

## GENESEE COUNTY.

- Andrews, Lewis B. Byron.
- Original. Crane, Frank W. Corfu.
- Founder. Jackson, Albert P. Oakfield.  
Prince, Alpheus. Byron.  
Stone, Frank L. Le Roy.
- Founder. Townsend, Morris W. Bergen.

6

## LIVINGSTON COUNTY.

- Original. Briggs, William H. Hemlock Lake.  
Brown, J. P. Tuscarora.  
Dodge, Frank H. Mount Morris.  
Jones, George H. Fowlerville.  
Kneeland, B. T. Dalton.
- Original. Menzie, R. J. Caledonia.
- Original. Moyer, Frank H. Moscow.

7

## MONROE COUNTY.

- Original. Backus, Ogden. Rochester.  
 Original. Buckley, James. Rochester.  
 Original. Burke, John J. A. Rochester.  
           . Curtis, D. F. Rochester.  
 Original. Dunning, J. D. Webster.  
           Fenno, Henry M. Rochester.  
           Goler, George W. Rochester.  
 Founder. Hovey, B. L. Rochester.  
           Jones, S. Case. Rochester.  
           Maine, Alva P. Webster.  
           McDougall, William D. Spencerport.  
 Founder. Moore, Edward M. Rochester.  
 Original. Moore, Edward M., Jr. Rochester.  
 Original. Moore, Richard Mott. Rochester.  
 Original. O'Hare, Thomas A. Rochester.  
 Original. Pease, Joseph. Hamlin.  
           Reitz, Charles. Webster.  
           Schopp, Justin H. Rochester.  
           Snook, George M. Parma.  
           Stockschlaeder, P. Rochester.

20

## NIAGARA COUNTY.

- Eddy, George P. Lewiston.  
 Huggins, William Q. Sanborn.

2

## ONTARIO COUNTY.

- Founder. Bentley, Francis R. Cheshire.  
           De Laney, John Pope. Geneva.  
 Original. Hicks, W. Scott. Bristol.  
 Founder. \*Nichols, H. W. Canandaigua.  
           Pratt, Frank R. Manchester.  
 Founder. Simmons, E. W. Canandaigua.  
 Original. Vanderhoof, Frederick D. Phelps.

7

\* Deceased.

## ORLEANS COUNTY.

- Original. Bailey, William C. Knoxville, Tenn.  
 Founder. Chapman, James. Medina.  
           Curtis, Daniel. Jeddo.  
 Original. Taylor, John H. Holley.  
 Founder. Tompkins, H. C. Knowlesville.

5

## STEUBEN COUNTY.

- Chittenden, Daniel J. Addison.  
 Conderman, George. Hornellsville.  
 Original. Dunn, Jeremiah. Bath.  
 Original. Ellison, Metler D. Canisteo.  
           Gilbert, Horatio. Hornellsville.  
           Hubbard, Chauncey G. Hornellsville.  
           Hunter, Nathaniel P. Jasper.  
 Original. Jamison, John S. Hornellsville.  
           Parkhill, C. S. Hornellsville.  
           Rudgers, Denton W. Hornellsville.  
           Walker, James E. Hornellsville.  
           Wallace, Edwin E. Jasper.

12

## WAYNE COUNTY.

- Founder. Arnold, J. Newton. Clyde.  
           Brandt, J. S. Ontario Centre.  
 Founder. Colvin, Darwin. Clyde.  
           Horton, David B. Red Creek.  
 Original. Ingraham, Samuel. Palmyra.  
 Original. Landon, Newell E. Newark.  
           Nutten, Wilbur F. Newark.  
 Original. Sprague, John A. Williamson.  
           Sprague, L. S. Williamson.  
 Original. Young, Augustus A. Newark.

10

## WYOMING COUNTY.

- Original. Ellinwood, A. G. Attica.  
           Fisher, John C. Warsaw.

- Greene, Cordelia A. Castile.  
 Hulette, G. S. Arcade.  
 Lusk, Zera J. Warsaw.  
 Original. Palmer, George M. Warsaw.  
 Original. Rae, Robert. Portageville.

7

#### YATES COUNTY.

- Oliver, William. Penn Yan.

1

### FIFTH OR SOUTHERN DISTRICT.

#### DUTCHESS COUNTY.

- Baker, Benjamin N. Rhinebeck.  
 Original. Barnes, Edwin. Pleasant Plains.  
 Barton, Thomas J. Tivoli.  
 Original. Bates, Xyris T. Poughkeepsie.  
 Original. Bayley, Guy Carleton. Poughkeepsie.  
 Founder. Codding, George H. Amenia.  
 Founder. Cramer, William. Poughkeepsie.  
 Original. Fletcher, Charles L. Wing's Station.  
 Howland, George T. Poughkeepsie.  
 Julian, John M. Pleasant Valley.  
 Founder. Kittridge, Charles M. Fishkill-on-Hudson.  
 Founder. Leroy, Irving D. Pleasant Valley.  
 Founder. \*Porteous, James G. Poughkeepsie.  
 Founder. Pultz, Monroe T. Stanfordville.  
 Van Etten, Cornelius S. Rhinebeck.  
 Original. \*Van Wyck, Richard C. Hopewell Junction.

16

#### KINGS COUNTY.

- Alleman, L. A. W. Brooklyn.  
 Baker, Frank R. Brooklyn.  
 Founder. Baker, George W. Brooklyn, E. D.  
 Beardsley, William E. Brooklyn.  
 Bierwirth, Julius C. Brooklyn.

\* Deceased.

- Original. Biggam, William H., Jr. Brooklyn.  
 Original. Brundage, Amos H. Brooklyn.  
 Original. Conway, John Francis. Brooklyn.  
 Coffin, Laurence. Brooklyn.  
 Creamer, Joseph, Jr. Brooklyn, E. D.  
 Criado, Louis F. Brooklyn.  
 Dalton, W. R. I. Brooklyn.  
 Feeley, James F. Brooklyn, E. D.  
 Gardiner, William F. Brooklyn.  
 Hicks, Edward E. Brooklyn.  
 Hughes, Peter. Brooklyn.  
 Hull, Thomas H. Brooklyn.  
 Original. Ilgen, Ernst. Brooklyn.  
 Original. Jenkins, John A. Brooklyn, E. D.  
 Jewett, F. A. Brooklyn.  
 Original. Leighton, Nathaniel W. Brooklyn.  
 Little, Frank. Brooklyn.  
 Original. Lloyd, T. Mortimer. Brooklyn.  
 Original. McCollom, William. Brooklyn.  
 Milbury, Frank S. Brooklyn.  
 Original. Minard, E. J. Chapin. Brooklyn.  
 Newman, George W. Brooklyn.  
 Original. North, Nelson L. Brooklyn.  
 Ostrander, George A. Brooklyn.  
 Page, Emmett D. Brooklyn.  
 Original. Paine, Arthur R. Brooklyn.  
 Peele, Francis. Brooklyn.  
 Original. Pray, S. R. Brooklyn.  
 Price, Henry R. Brooklyn.  
 Raynor, F. C. Brooklyn.  
 Reed, Henry B. Brooklyn.  
 Richardson, John E. Brooklyn.  
 Risch, Henry F. W. Brooklyn.  
 Rochester, Thomas M. Brooklyn.  
 Founder. Rushmore, John D. Brooklyn.  
 Original. Russell, William G. Brooklyn.  
 Founder. Segur, Avery. Brooklyn.  
 Original. Shepard, A. Warren. Brooklyn.  
 Original. Sizer, Nelson Buell. Brooklyn.  
 Founder. Squibb, Edward H. Brooklyn.  
 Founder. Squibb, Edward R. Brooklyn.  
 Original. Steinke, Carl Otho Hermann. Brooklyn.



- Sullivan, John D. Brooklyn.  
 Thwing, Clarence. Fort Wrangel, Alaska.  
 Waterworth, William. Brooklyn.  
 Original. \*Wieber, George. Brooklyn.  
 Original. Williams, William H. Brooklyn.  
             Wright, Jonathan. Brooklyn.  
 Founder. Wyckoff, Richard M. Brooklyn.

54

## NEW YORK COUNTY.

- Adams, Calvin Thayer. New York.  
 Agramonte, Aristides. New York.  
 Agramonte, E. V. New York.  
 Original. Allen, S. Busby. New York.  
             Allen, Thomas H. New York.  
             Anderson, R. Harcourt. New York.  
             Andrews, John L. New York.  
             Arango, Augustin. New York.  
 Original. Arcularius, Lewis. New York.  
 Original. Arnold, Edmund S. F. New York.  
             Arnold, Glover C. New York.  
             Baldwin, F. A. New York.  
             Bermingham, Edward J. New York.  
 Original. Biggs, Herman M. New York.  
 Founder. Bozeman, Nathan. New York.  
             Bozeman, Nathan G. New York.  
             Brodrick, William P. New York.  
 Original. Bryant, Joseph D. New York.  
 Original. Buchanan, Alexander. New York.  
 Original. Bull, Charles Stedman. New York.  
             Bull, William T. New York.  
 Original. Burchard, Thomas H. New York.  
             Campbell, Clarence G. New York.  
             Carr, William. New York.  
 Original. Carter, H. Skelton. New York.  
 Original. Chauveau, Jean F. New York.  
 Original. Chrystie, T. M. Ludlow. New York.  
             Collins, Stacy B. Seaford, Sussex Co., Del.  
             Comfort, John E. New York.  
 Founder. Conover, William S. New York.

\* Deceased.

- Conway, John R. New York.
- Original. Curry, Walker. New York.
- Dallas, Alexander. New York.
- Daniels, F. H. New York.
- Davis, J. Griffith. New York.
- Davis, Robert C. New York.
- De Garmo, W. B. New York.
- Delphey, Eden V. New York.
- Dench, Edward B. New York.
- Original. Denison, C. Ellery. New York.
- Original. Denison, Ellery. New York.
- Founder. Dennis, Frederic S. New York.
- de Quesada, Gregorio J. New York.
- Drake, W. F. New York.
- Original. Du Bois, Matthew B. New York.
- Dudley, A. Palmer. New York.
- Dunham, Edward K. New York.
- Original. Eastman, Robert W. New York.
- Einhorn, Max. New York.
- Original. Eliot, Ellsworth. New York.
- Enders, Thomas Burnham. New York.
- Erdmann, John F. New York.
- Farrington, Edward S. New York.
- Farrington, Joseph O. New York.
- Ferguson, Frank. New York.
- \*Field, Matthew D. New York.
- Founder. Flint, Austin. New York.
- Flint, Austin, Jr. New York.
- Founder. Flint, William H. New York.
- Foster, George V. New York.
- Frankenberg, Jacob H. New York.
- Fridenberg, Edward. New York.
- Original. Furman, Guido. New York.
- Gleitsmann, J. W. New York.
- Founder. Gouley, John W. S. New York.
- Grauer, Frank. New York.
- Gray, Joseph F. New York.
- Gulick, A. Reading. New York.
- Gulick, Charlton R. New York.
- Hammond, Frederick Porter. New York.
- Original. Harrison, George Tucker. New York.

\*Deceased.

- Haubold, H. A. New York.  
 Hepburn, Neil J. New York.  
 Hillis, Thomas J. New York.  
 Founder. Hinton, John H. New York.  
 Founder. Hodgman, Abbott. New York.  
 Holmes, Martha C. New York.  
 Hubbard, Dwight L. New York.  
 Jackson, Charles W. New York.  
 Founder. Janeway, Edward G. New York.  
 Janvrin, J. E. New York.  
 Jenkins, William T. New York.  
 Judson, A. B. New York.  
 Kelly, Thomas. New York.  
 Kemp, William M. New York.  
 King, Ferdinand. New York.  
 Kneer, F. G. New York.  
 Knipe, George. New York.  
 Founder. Leale, Charles A. New York.  
 Lewis, Robert. New York.  
 Little, Albert H. New York.  
 Lockwood, Charles E. New York.  
 Ludlow, Ogden C. New York.  
 Lukens, Anna. New York.  
 Founder. Lusk, William T. New York.  
 Lynch, Patrick J. New York.  
 MacGregor, James R. New York.  
 Mackenzie, J. C. New York.  
 McAlpine, D. Hunter. New York.  
 McBurney, Charles. New York.  
 McGillicuddy, T. J. New York.  
 McGowan, John P. New York.  
 McIlroy, Samuel H. New York.  
 McLeod, Johnston. New York.  
 Founder. McLeod, S. B. Wylie. New York.  
 Original. McLochlin, James A. New York.  
 Original. McNamara, Laurence J. New York.  
 McNicholl, Thomas A. New York.  
 Maher, J. J. E. New York.  
 Founder. Manley, Thomas H. New York.  
 Marshall, Francis F. New York.  
 Meier, Gottlieb, C. H. New York.  
 Original. Miller, William T. New York.

- Milliken, S. E. New York.  
 Original. Miranda, Ramon L. New York.  
 Original. Mitchell, Hubbard W. New York.  
 Moran, James. New York.  
 Mott, Valentine. New York.  
 Original. Murphy, John. New York.  
 Original. Murray, Sandford J. New York.  
 Original. Newman, Robert. New York.  
 Founder. Nicoll, Henry D. New York.  
 Original. Obendorfer, Isidor P. New York.  
 O'Brien, Frederick William. New York.  
 O'Brien, M. Christopher. New York.  
 Ochs, Benjamin F. New York.  
 \*O'Meagher, William. New York.  
 Oppenheimer, H. S. New York.  
 Oppenheimer, S. New York.  
 Painter, Henry McM. New York.  
 Palmer, Edmund J. New York.  
 Park, William Hallock. New York.  
 Parker, Ransom J. New York.  
 Original. Parsons, John. New York.  
 Perry, John Gardner. New York.  
 Phelps, Charles. New York.  
 Original. Pooler, Hiram A. New York.  
 Original. Porter, P. Brynberg. New York.  
 Potter, E. Styles. New York.  
 Pritchard, R. L. New York.  
 Pryor, William R. New York.  
 Founder. Purple, Samuel S. New York.  
 \*Ransom, H. B. New York.  
 Rau, Leonard S. New York.  
 Read, Ira B. New York.  
 Original. Ricketts, Benjamin M. Cincinnati, O.  
 Roth, Julius A. New York.  
 Ruggles, Augustus D. New York.  
 Original. Sabine, Gustavus A. New York.  
 Sanders, E. New York.  
 Founder. Sayre, Lewis A. New York.  
 Sayre, Reginald H. New York.  
 Seaman, Louis L. New York.  
 Shaw, Henry B. New York.

\* Deceased.

- Shea, Dennis L. New York.  
 Shradý, John. New York.  
 Shradý, John Eliot. New York.  
 Silver, Henry M. New York.  
 Simmons, Charles E. New York.  
 Smith, Alexander H. New York.  
 Original. Smith, J. Lewis. New York.  
 Original. Smith, Samuel W. New York.  
 Original. Smith, Stephen. New York.  
 Spicer, Walter E. New York.  
 Stewart, F. E. New York.  
 Stewart, George D. New York.  
 Strong, Cyrus J. New York.  
 Syms, Parker. New York.  
 Founder. Thomas, T. Gaillard. New York.  
 Thompson, Von Beverhout. New York.  
 Tiemann, Paul E. New York.  
 Truax, J. G. New York.  
 Founder. Tucker, Carlos P. New York.  
 Van Fleet, Frank. New York.  
 Vincent, Ludger C. New York.  
 Von Dönhoff, Edward. New York.  
 Original. Wallach, Joseph N. New York.  
 Walsh, Simon J. New York.  
 Founder. Ward, Charles S. New York.  
 Warner, John W. New York.  
 Weeks, John E. New York.  
 Weston, Albert T. New York.  
 White, Charles B. New York.  
 White, J. Blake. New York.  
 Founder. White, Whitman V. New York.  
 Founder. Wiener, Joseph. New York.  
 Wiggin, Frederick Holme. New York.  
 Williams, Henry Smith. New York.  
 Woodend, William E. New York.  
 Original. Wyeth, John A. New York.  
 Yankauer, Sidney. New York.

ORANGE COUNTY.

- Conner, Milton C. Middletown.  
 Davis, J. O. Howells.



Potts, E. Port Jervis.  
Swartwout, H. B. Port Jervis.  
Townsend, Charles E. Newburgh.  
Vanderveer, J. C. Monroe.  
Vanderveer, J. R. Monroe.

7

## PUTNAM COUNTY.

Founder. Murdock, George W. Cold Spring.  
Founder. Young, William. Cold Spring.

2

## QUEENS COUNTY.

Original. Burns, William J. Sea Cliff.  
Original. Rave, Edward G. Hicksville.

2

## RICHMOND COUNTY.

Johnston, Henry C. New Brighton.  
Martindale, F. E. Port Richmond.  
Walser, William C. West New Brighton.

3

## SUFFOLK COUNTY.

Original. Chambers, Martin L. Port Jefferson.  
Hamill, Edward H. Newark, N. J.  
Hulse, William A. Bay Shore.  
Original. Lindsay, Walter. Huntington.

4

## SULLIVAN COUNTY.

Original. Bennett, Thomas W. Jeffersonville.  
Crocker, Edwin. Narrowsburgh.  
DeKay, William H. Parksville.  
Johnston, N. C. Barryville.  
McWilliams, F. A. Monticello.  
Original. Munson, J. A. Woodburne.  
Piper, Charles W. Wurtsborough.  
Stearns, Benjamin W. Long Eddy.

8

ULSTER COUNTY.

- Original. Chambers, Jacob. Kingston.  
Original. HoornBeek, Philip Du Bois. Wawarsing.  
Founder. Hühne, August. Rondout.  
Original. Hühne, Frederick. Rondout.  
Reed, Albert. Highland.  
Original. Van Hovenberg, Henry. Kingston.  
Ward, John J. Ellenville.

7

## WESTCHESTER COUNTY.

- |           |                              |                   |
|-----------|------------------------------|-------------------|
|           | Acker, Thomas J.             | Croton-on-Hudson. |
| Original. | Banks, George B.             | Hartsdale.        |
| Original. | Brush, Edward F.             | Mount Vernon.     |
| Original. | Coutant, Richard B.          | Tarrytown.        |
| Original. | Furman, J. Henry.            | Tarrytown.        |
|           | Granger, William D.          | Mount Vernon.     |
| Original. | Huntington, Henry K.         | New Rochelle.     |
| Original. | Lyons, G. A.                 | New Rochelle.     |
| Original. | Schmid, H. Ernst.            | White Plains,     |
|           | Small, John W.               | North Tarrytown.  |
| Original. | Southworth, Richmond Joseph. | Washington, D. C. |
| Original. | Wells, William L.            | New Rochelle.     |

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### SUMMARY OF FELLOWSHIP BY DISTRICTS.

[illegible]

## ALPHABETICAL LIST OF FELLOWS.

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- Aberdein, Robert, Warren and Fayette Sts., Syracuse, Onondaga Co. Original.
- Abrams, H. C., Newtonville, Albany Co.
- Acker, Thomas J., Croton-on Hudson, Westchester Co.
- Adams, Calvin Thayer, 21 E. 8th St., New York, New York Co.
- Agramonte, Aristides, 144 W. 79th St., New York, New York Co.
- Agramonte, E. V., 132 W. 98th St., New York, New York Co.
- Alleman, L. A. W., 64 Montague St., Brooklyn, Kings Co.
- Allen, Amos, Grafton, Rensselaer Co. Original.
- Allen, Charles S., Greenbush, Rensselaer Co. Founder.
- Allen, Henry J., Corinth, Saratoga Co.
- Allen, S. Busby, 1364 Lexington Ave., New York, New York Co.
- Allen, S. P., Whitney's Point, Broome Co.
- Allen, Thomas H., 52 W. 45th St., New York, New York Co.
- Allen, William L., Greenbush, Rensselaer Co.
- Ames, Edward, 123 E. Lovell St., Kalamazoo, Mich. Founder.
- Anderson, R. Harcourt, 243 W. 21st St., New York, New York Co.
- Andrews, Charles H., Holland, Erie Co.
- Andrews, John L., 307 E. 86th St., New York, New York Co.
- Andrews, Lewis B., Byron, Genesee Co.
- Arango, Augustin, 132 Madison Ave., New York, New York Co.
- Arcularius, Lewis, 121 E. 25th St., New York, New York Co. Original.
- Armstrong, James A., Clinton, Oneida Co.
- Arnold, Edmund S. F., 64 Madison Ave., New York, New York Co. Original.
- Arnold, Glover C., 115 E. 30th St., New York, New York Co.
- Arnold, J. Newton, Clyde, Wayne Co. Founder.
- Atwood, H. L., Collins Centre, Erie Co. Original.
- Ayer, W. L., Owego, Tioga Co. Original.
- Ayres, Douglas, Fort Plain, Montgomery Co. Original.
- Backus, Ogden, 67 S. Fitzhugh St., Rochester, Monroe Co. Original.
- Bacon, Charles G., Fulton, Oswego Co. (Retired list.)

- Bagg, Mosès M., Utica, Oneida Co. Original. (Retired list.)  
 Bailey, Theodore P., 95 Eagle St., Albany, Albany Co. Founder.  
 Bailey, William C., Knoxville, Tenn. Original.  
 Baker, Benjamin N., Rhinebeck, Dutchess Co.  
 Baker, Frank R., 540 Bedford Ave., Brooklyn, E. D., Kings Co.  
 Baker, George W., 540 Bedford Ave., Brooklyn, E. D., Kings Co.  
 Founder.  
 Baldwin, F. A., 129 W. 77th St., New York, New York Co.  
 Banks, George B., Hartsdale, Westchester Co. Original. (Retired list.)  
 Banta, Rollin L., 330 Elk St., Buffalo, Erie Co. Original.  
 Barnes, Edwin, Pleasant Plains, Dutchess Co. Original.  
 Barney, Charles S., Milford, Otsego Co. Original.  
 Barnum, D. Albert, Cassville, Oneida Co.  
 Bartlett, Fred. W., 523 Delaware Ave., Buffalo, Erie Co. Original.  
 Barton, Lyman, Willsborough, Essex Co. Founder. (Retired list.)  
 Barton, L. G., Willsborough, Essex Co.  
 Barton, Thomas J., Tivoli, Dutchess Co.  
 Bates, Nelson W., Central Square, Oswego Co.  
 Bates, Xyris T., Poughkeepsie, Dutchess Co. Original.  
 Bayley, Guy Carleton, Poughkeepsie, Dutchess Co. Original.  
 Baynes, Joseph E., 2419 5th Ave., Troy, Rensselaer Co.  
 Beardsley, William E., 101 Taylor St., Brooklyn, Kings Co.  
 Beers, John E., Danby, Tompkins Co. Founder.  
 Bellows, George A., Waterloo, Seneca Co.  
 Bemus, Morris N., Jamestown, Chautauqua Co.  
 Bemus, William Marvin, Jamestown, Chautauqua Co.  
 Benham, John C., Hudson, Columbia Co. Original.  
 Bennett, Arthur G., 213 Franklin St., Buffalo, Erie Co.  
 Bennett, Thomas W., Jeffersonville, Sullivan Co. Original.  
 Bentley, F. R., Cheshire, Ontario Co. Original. (Retired list.)  
 Bergtold, W. H., 56 Allen St., Buffalo, Erie Co.  
 Birmingham, Edward J., 8 E. 47th St., New York, New York Co.  
 Bierwirth, Julius C., 137 Montague St., Brooklyn, Kings Co.  
 Biggam, William H., Jr., 1095 Dean St., Brooklyn, Kings Co.  
 Original.  
 Biggs, Chauncey P., 14 E. Seneca St., Ithaca, Tompkins Co.  
 Biggs, H. M., 5 W. 58th St., New York, New York Co. Original.  
 Birdsall, Gilbert, North Brookfield, Madison Co. Original.  
 Bissell, James H., 2187 5th Ave., Troy, Rensselaer Co.  
 Blaine, Myron D., Willard, Seneca Co.  
 Blair, Louis P., McDonough, Chenango Co. Original.

- Blake, Clarence R., Northville, Fulton Co. Original.
- Blumer, G. Alder, State Hospital, Utica, Oneida Co. Original.
- Boies, Loren F., 286 Howard Ave., Buffalo, Erie Co. Original.
- Bond, G. F. M., State Hospital, Utica, Oneida Co.
- Bonesteel, H. F., Mill St., Troy, Rensselaer Co.
- Bonesteel, William N., Mill St., Troy, Rensselaer Co. Founder.  
(Retired list.)
- Bontecou, Reed B., 82 4th St., Troy, Rensselaer Co. Original.
- Booth, Wilbur H., 172 Genesee St., Utica, Oneida Co. Original.
- Boyce, Elias B., Averill Park, Rensselaer Co.
- Bozeman, Nathan, 9 W. 31st St., New York, New York Co. Founder.
- Bozeman, Nathan G., 9 W. 31st St., New York, New York Co.
- Bradford, George D., Homer, Cortland Co.
- Bradley, O. Howard, Hudson, Columbia Co.
- Brandt, J. S., Ontario Centre, Wayne Co.
- Briggs, Albert H., 267 Hudson St., Buffalo, Erie Co. Original.
- Briggs, William H., Hemlock Lake, Livingston Co. Original.
- Brodrick, William P., 164 W. 121st St., New York, New York Co.
- Brooks, Leroy J., Norwich, Chenango Co. Original.
- Brooks, Mark N., Springville, Erie Co.
- Brown, Chas. W., 902 14th St., N. W., Washington, D. C. Original.
- Brown, George L., 121 Franklin St., Buffalo, Erie Co.
- Brown, J. P., Nunda, Livingston Co.
- Brown, Ulysses H., 312 Warren St., Syracuse, Onondaga Co.
- Brundage, A. H., 609 Madison St., Brooklyn, Kings Co. Original.
- Brush, Edward F., Mount Vernon, Westchester Co. Original.
- Brush, Edward N., Shepperd Asylum, Towsen, Md. Original.
- Bryant, J. D., 54 W. 36th St., New York, New York Co. Original.
- Bryant, Percy, State Hospital, Buffalo, Erie Co.
- Buchanan, Alexander, 358 W. 30th St., New York, New York Co.  
Original.
- Buckley, James, 127 E. Main St., Rochester, Monroe Co. Original.
- Bull, Charles Stedman, 47 W. 36th St., New York, New York Co.  
Original.
- Bull, William T., 35 W. 35th St., New York, New York Co.
- Burbeck, Chas. H., 91 First St., Troy, Rensselaer Co. Founder.
- Burchard, T. H., 7 E. 48th St., New York, New York Co. Original.
- Burghardt, Francis Augustus, 632 Elm Street, Buffalo, Erie Co.
- Burhyte, O. W., Brookfield, Madison Co.
- Burke, John J. A., 65 East Ave., Rochester, Monroe Co. Original.
- Burns, William J., Sea Cliff, Queens Co. Original.
- Burton, Henry B., 75 4th St., Troy, Rensselaer Co.



- \*Burton, Matthew H., 75 4th St., Troy, Rensselaer Co. Founder.  
 Cady, George N., Nichols, Tioga Co.  
 Cahill, John T., Hoosick Falls, Rensselaer Co.  
 Caldwell, Nathan A., Hageman's Mills, Montgomery Co.  
 Campbell, A. J., 332 Warren St., Syracuse, Onondaga Co.  
 Campbell, Clarence G., 68 W. 35th St., New York, New York Co.  
 Carpenter, Henry W., Oneida, Madison Co. Original.  
 Carr, William, 35 W. 46th St., New York, New York Co.  
 Carter, H. S., 130 E. 24th St., New York, New York Co. Original.  
 Casey, J. E., Mohawk, Herkimer Co.  
 Cavana, Martin, Oneida, Madison Co.  
 Chambers, Jacob, Kingston, Ulster Co. Original.  
 Chambers, Martin L., Port Jefferson, Suffolk Co. Original.  
 Chapman, James, Medina, Orleans Co. Founder.  
 Chauveau, Jean F., 31 W. 60th St., New York, New York Co.  
 Original.  
 Chittenden, Daniel J., Addison, Steuben Co.  
 Chittenden, Joseph H., Binghamton, Broome Co. Founder.  
 Chrystie, T. M. Ludlow, 216 W. 46th St., New York, New York Co.  
 Original.  
 Church, B. A., Oneonta, Otsego Co.  
 Church, Charles A., Bloomingdale, Essex Co.  
 Church, Thomas C., Valley Falls, Rensselaer Co.  
 Churchill, Alonzo, 189 Genessee St., Utica, Oneida Co. (Retired  
 list.)  
 Clark, Dewitt C., Marathon, Cortland Co. Original.  
 Clark, George W., Waterloo, Seneca Co.  
 Clarke, Wallace, 136 Park Ave., Utica, Oneida Co.  
 Clendenan, C. W., N. Tonawanda, Erie Co.  
 Clum, Franklin D., Cheviot, Columbia Co.  
 Coddling, George H., Amenia, Dutchess Co. Founder.  
 Coffin, Lawrence, 473 Bedford Ave., Brooklyn, Kings Co.  
 Cohen, Bernard, 497 Niagara St., Buffalo, Erie Co.  
 Collins, Stacy B., Seaford, Sussex Co., Del.  
 Colvin, Darwin, Clyde, Wayne Co. Founder.  
 Comfort, John E., 1315 Franklin Ave., New York, New York Co.  
 Comstock, George F., Saratoga Springs, Saratoga Co. Founder.  
 Conderman, George, Hornellsville, Steuben Co.  
 Congdon, Charles E., 1034 Jefferson St., Buffalo, Erie Co.  
 Conkling, George, Durham, Greene Co. Original.  
 Conner, Milton C., Middletown, Orange Co.

- Conover, William S., 237 W. 132d St., New York, New York Co.  
Founder.
- Conway, John Francis, cor. Buffalo and Union Sts., Brooklyn,  
Kings Co. Original.
- Conway, John R., 130 Lexington Ave., New York, New York Co.
- Cook, Guy Reuben, Louisville, St. Lawrence Co.
- Cooke, Almon H., 410 Ashland Ave., Buffalo, Erie Co.
- Cooley, F. L., 210 First St., Oswego, Oswego Co.
- Cooley, R. N., Hannibal Centre, Oswego Co.
- Cooper, William C., 81 3d St., Troy, Rensselaer Co. Original.
- Copley, Herman D., Bainbridge, Chenango Co.
- Coutant, Richard B., Tarrytown, Westchester Co. Original.
- Cramer, William, 136 Mansion St., Poughkeepsie, Dutchess Co.  
Founder.
- Crane, Frank W., Corfu, Genessee Co. Original.
- Crawe, J. Mortimer, Watertown, Jefferson Co. Founder.
- Creamer, Joseph, Jr., 168 N. 6th St., Brooklyn, E. D., Kings Co.
- Criado, Louis F., 147 Fort Green Place, Brooklyn, Kings Co.
- Crocker, Edwin, Narrowsburg, Sullivan Co.
- Crombie, Walter C., Mechanicsville, Saratoga Co. Original.
- Cronyn, John, 55 W. Swan St., Buffalo, Erie Co. Founder.
- Crosby, Alexander H., Lowville, Lewis Co.
- Crounse, Andrew C., Melrose, Rensselaer Co.
- Curry, Walker, 21 E. 61st St., New York, New York Co. Original.
- Curtis, Daniel, Jeddo, Orleans Co.
- Curtis, D. F., 102 South Ave., Rochester, Monroe Co.
- Curtis, P. C., Round Lake, Saratoga Co.
- Dagenais, Alphonse, 473 W. Virginia St., Buffalo, Erie Co. Original.
- Dallas, Alexander, 22 E. 22d St., New York, New York Co.
- Dallas, Alexander J., 48 Warren St., Syracuse, Onondaga Co.  
Founder.
- Dalton, W. R. I., 708 Halsey St., Brooklyn, Kings Co.
- Dandridge, N. P., 148 Broadway, Cincinnati, Ohio.
- Daniels, Clayton M., 868 Main St., Buffalo, Erie Co. Original.
- Daniels, F. H., 140 W. 126th St., New York, New York Co.
- D'Avignon, Francis J., Au Sable Forks, Essex Co. Original.
- Davis, J. Griffith, 200 W. 14th St., New York, New York Co.
- Davis, J. O., Howells, Orange Co.
- Davis, Robert C., 150 E. 128th St., New York, New York Co.
- Dayton, C. L., 246 Dearborn St., Buffalo, Erie Co. (Retired list.)
- Dean, Harmon J., Brocton, Chautauqua Co. Founder.
- DeGarmo, W. B., 56 W. 36th St., New York, New York Co.

- DeKay, William H., Parksville, Sullivan Co.  
 DeLaney, John Pope, Geneva, Ontario Co.  
 Delphey, Eden V., 353 W. 57th St., New York, New York Co.  
 Dench, Edward B., 17 W. 46th St., New York, New York Co.  
 Denison, Charles Ellery, 113 W. 12th St., New York, New York Co.  
     Original.  
 Denison, Ellery, 113 W. 12th St., New York, New York Co.  
     Original.  
 Dennis, Frederick S., 542 Madison Ave., New York, New York Co.  
     Founder.  
 DeQuesada, Gregorio J., 413 W. 43d St., New York, New York Co.  
 De Witt, Byron, Oswego, Oswego Co.   Original.  
 De Zouche, Isaac, Gloversville, Fulton Co.   Founder.  
 Dickinson, M. D., Troy, Rensselaer Co.  
 Dickson, Thomas Gordon, Troy, Rensselaer Co.  
 Didama, Emory A., Cortland, Cortland Co.  
 Didama, Henry D., 112 S. Salina St., Syracuse, Onondaga Co.  
     Founder.  
 Dodge, Amos P., Oneida Castle, Oneida Co.  
 Dodge, Frank B., Mount Morris, Livingston Co.  
 Dodge, Lyndhurst C., Rouse's Point, Clinton Co.   Founder.  
 Donohue, Florence O., 410 Warren St., Syracuse, Onondaga Co.  
     Original.  
 Dorland, Elias T., 86 N. Division St., Buffalo, Erie Co.   Original.  
 Douglas, Edgar H., Little Falls, Herkimer Co.  
 Douglas, George, Oxford, Chenango Co.  
 Douglass, A. J., Ilion, Herkimer Co.  
 Douglass, Charles E., Lowville, Lewis Co.  
 Douglass, James W., Boonville, Oneida Co.  
 Drake, D. Delos, Johnstown, Fulton Co.  
 Drake, E. G., 312 W. Church St., Elmira, Chemung Co.  
 Drake, Frank C., Oneida, Madison Co.  
 Drake, James B., Hancock, Delaware Co.  
 Drake, W. F., 101 W. 34th St., New York, New York Co.  
 Du Bois, Matthew B., 66 Broadway, Manhattan Life Ins. Co., New  
     York, New York Co.   Original.  
 Dudley, A. Palmer, 678 Madison Ave., New York, New York Co.  
 Dudley, Dwight, Maine, Broome Co.  
 Dunham, Edward K., 338 E. 26th St., New York, New York Co.  
 Dunlop, John J., Waterford, Saratoga Co.   Original.  
 Dunn, Jeremiah, Bath, Steuben Co.   Original.  
 Dunning, J. D., Webster, Monroe Co.   Original.

- Earle, George W., Tully, Onondaga Co.  
 Eastman, L. O., Union, Broome Co.  
 Eastman, Robert W., 170 W. 76th St., New York, New York Co.  
     Original.  
 Eddy, George P., Lewiston, Niagara Co.  
 Eddy, John L., Olean, Cattaraugus Co.  
 Edwards, Amos S., 1506 N. Salina St., Syracuse, Onondaga Co.  
     Original.  
 Edwards, George A., Catherine and Lodi Sts., Syracuse, Onondaga Co. Original.  
 Edwards, John, Gloversville, Fulton Co.  
 Einhorn, Max, 20 E. 63d St., New York, New York Co.  
 Eldridge, Stuart, Yokohama, Japan. (Non-resident.)  
 Eliot, Ellsworth, 48 W. 36th St., New York, New York Co. Original.  
 Ellinwood, A. G., Attica, Wyoming Co. Original.  
 Ellis, J. B., Whitesborough, Oneida Co.  
 Ellison, Metler D., Canisteo, Steuben Co. Original.  
 Ellsworth, Victor A., 41 Waltham St., Boston, Mass.  
 Ely, Henry Oliver, Binghamton, Broome Co. Original.  
 Enders, Thomas Burnham, 163 W. 121st St., New York, New York Co.  
 English, G. P., Booneville, Oneida Co.  
 Erdmann, John F., 144 W. 44th St., New York, New York Co.  
 Farnham, LeRoy D., Binghamton, Broome Co.  
 Farrington, Edward S., 213 W. 81st St., New York, New York Co.  
 Farrington, John M., Binghamton, Broome Co.  
 Farrington, Joseph O., 1991 Madison Ave., New York, New York Co.  
 Feeley, James F., 296 Lorimer St., Brooklyn, E. D., Kings Co.  
 Fell, George E., 72 Niagara St., Buffalo, Erie Co.  
 Fenno, Henry Marshall, 77 W. Main St., Rochester, Monroe Co.  
 Ferguson, E. D., 1 Union Place, Troy, Rensselaer Co. Founder.  
 Ferguson, Frank, 20 W. 38th St., New York, New York Co.  
 \*Field, Matthew D., 115 E. 40th St., New York, New York Co.  
 Finder, William, Jr., 2 Union Place, Troy, Rensselaer Co. Founder.  
 Fisher, John C., Warsaw, Wyoming Co.  
 Fitzgerald, David J., Glens Falls, Warren Co.  
 Fitzgerald, John F., State Custodial Asylum, Rome, Oneida Co.  
 Flandrau, Thomas M., Rome, Oneida Co.  
 Flanigan, John R., Syracuse, Onondaga Co.  
 Fletcher, Charles L., Wing's Station, Dutchess Co. Original.  
 Flickinger, John, Trumansburg, Tompkins Co.  
 Flint, Austin, 60 E. 34th St., New York, New York Co. Founder.

\*Deceased

- Flint, Austin, Jr., 18 E. 45th St., New York, New York Co.  
 Flint, William H., Ridgefield, Conn. Founder (Retired list.)  
 Ford, M. L., Oneonta, Otsego Co.  
 Forker, Frederick L., Binghamton, Broome Co.  
 Foster, George V., 109 E. 18th St., New York, New York Co.  
 Fowler, Joseph, 31 Church St., Buffalo, Erie Co.  
 Frankenberg, Jacob H., 142 E. 74th St., New York, New York Co.  
 Fraser, Jefferson C., Ava, Oneida Co.  
 Frederick, Carlton C., 64 Richmond Ave., Buffalo, Erie Co.  
 French, S. H., Amsterdam, Montgomery Co.  
 Fridenberg, Edward, 2019 Fifth Ave., New York, New York Co.  
 Fritts, Crawford Ellsworth, Hudson, Columbia Co.  
 Fuller, Earl D., 66 Varick St., Utica, Oneida Co.  
 Furman, G., 234 W. 34th St., New York, New York Co. Original.  
 Furman, J. Henry, Tarrytown, Westchester Co. Original.  
 Gardner, W. F., 175 6th Ave., Brooklyn, Kings Co.  
 Garlock, William D., Little Falls, Herkimer Co.  
 Getty, A. H., Athens, Greene Co.  
 Gibson, William M., 187 Genesee St., Utica, Oneida Co.  
 Gilbert, Horatio, Hornellsville, Steuben Co.  
 \*Gillis, William, Fort Covington, Franklin Co. Founder.  
 Gleitsmann, J. W., 46 E. 25th St., New York, New York Co.  
 Glidden, Charles H., Little Falls, Herkimer Co. Original.  
 Goler, George W., 54 S. Fitzhugh St., Rochester, Monroe Co.  
 Gould, Cassius W., 1428 Main St., Buffalo, Erie Co.  
 Gouley, J. W. S., 11 E. 43d St., New York, New York Co. Founder.  
 Gow, Frank F., Schuylerville, Saratoga Co.  
 Granger, William D., Bronxville (Vernon House), Westchester Co.  
 Grant, Charles S., Saratoga Springs, Saratoga Co. Founder.  
 Grauer, Frank, 326 W. 46th St., New York, New York Co.  
 Gravatte, Edwin J., 361 Second St., Troy, Rensselaer Co.  
 Graves, Ezra, Amsterdam, Montgomery Co. Original.  
 Gray, Joseph F., 354 W. 29th St., New York, New York Co.  
 Green, H. H., Paine's Hollow, Herkimer Co.  
 Green, Stephen S., 426 Niagara St., Buffalo, Erie Co.  
 Greene, Clark W., Binghamton, Broome Co.  
 Greene, Cordelia A., Castile, Wyoming Co.  
 Greene, DeWitt C., 1125 Main St., Buffalo, Erie Co. Original.  
 Greene, Joseph C., 124 Swan St., Buffalo, Erie Co. Founder.  
 Greene, Walter D., 444 Elk St., Buffalo, Erie Co. Original.  
 Greenman, C. E., 575 1st St., Troy, Rensselaer Co.



- Gulick, A. Reading, 30 W. 36th St., New York, New York Co.  
Gulick, Charlton R., 30 W. 36th St., New York, New York Co.  
Guy, J. D., Chenango Forks, Broome Co.  
Hagadorn, William, Gilboa, Schoharie Co. Original.  
Halbert, M. L., Cincinnatus, Cortland Co.  
Hall, William H., Saratoga Springs, Saratoga Co. Original.  
Hamill, Edward H., 302 6th Ave., Newark, N. J.  
Hammer, Charles, Schenectady, Schenectady Co.  
Hammond, Frederick P., 143 E. 117th St., New York, New York Co.  
Hand, S. M., Norwich, Chenango Co.  
Hannan, James C., Hoosick Falls, Rensselaer Co. Founder.  
Hannan, Thomas H., Hoosick Falls, Rensselaer Co.  
Harrington, D. W., 1430 Main St., Buffalo, Erie Co. Original.  
Harrison, George Tucker, 221 W. 23d St., New York, New York Co.  
Original.  
Hartwig, Marcell, 34 E. Huron St., Buffalo, Erie Co.  
Harvie, J. B., 6 Clinton Place, Troy, Rensselaer Co. Founder.  
Hatch, C. A., 10 E. Onondaga St., Syracuse, Onondaga Co.  
Original.  
Haubold, H. A., 140 E. 72d St., New York, New York Co.  
Hayd, Herman E., 78 Niagara St., Buffalo, Erie Co.  
Hayes, Philetus A., Afton, Chenango Co.  
Haynes, John U., 103 Mohawk St., Cohoes, Albany Co.  
Head, Adelbert D., 202 E. Genesee St., Syracuse, Onondaga Co.  
Founder.  
Heath, William H., 415 Pearl St., Buffalo, Erie Co.  
Heimstreet, Thomas B., 14 Division St., Troy, Rensselaer Co.  
Original.  
Hendrick, Henry C., McGrawville, Cortland Co. Founder.  
Hepburn, Neil J., 369 W. 23d St., New York, New York Co.  
Hicks, Edward E., 923 Jefferson Ave., Brooklyn, Kings Co.  
Hicks, W. Scott, Bristol, Ontario Co. Original.  
Higgins, F. W., Cortland, Cortland Co.  
Hillis, Thomas J., 51 Charlton St., New York, New York Co.  
Hills, Lyman H., Binghamton, Broome Co. Original.  
Himmelsbach, George A., 30 12th St., Buffalo, Erie Co.  
Hinton, John H., 41 W. 32d St., New York, New York Co. Founder.  
Hodgman, Abbott, 141 E. 38th St., New York, New York Co.  
Founder.  
Hodgman, William H., 108 Caroline St., Saratoga Springs, Saratoga Co. Founder.  
Holcomb, O. A., Plattsburgh, Clinton Co.

- Holden, Arthur L., 116 South St., Utica, Oneida Co.  
Holmes, Martha C., 75 W. 126th St., New York, New York Co.  
HoornBeek, Philip Du Bois, Warwarsing, Ulster Co. Original.  
(Retired list.)  
Horton, David B., Red Creek, Wayne Co.  
Hough, F. P., Binghamton, Broome Co.  
Houston, David W., 44 2d St., Troy, Rensselaer Co. Original.  
Hovey, B. L., 34 N. Fitzhugh St., Rochester, Monroe Co. Founder.  
Howard, Charles F., 1458 Main St., Buffalo, Erie Co.  
Howland, George T., Poughkeepsie, Dutchess Co.  
Hoyer, F. F., Tonawanda, Erie Co. Founder.  
Hubbard, Chauncey G., Hornellsville, Steuben Co.  
Hubbard, Dwight L., 117 W. 93d St., New York, New York Co.  
Hubbell, Alvin A., 212 Franklin St., Buffalo, Erie Co.  
Hudson, George, Stillwater, Saratoga Co.  
Huestis, W. B., Kiskatom, Greene Co.  
Huggins, William Q., Sanborn, Niagara Co.  
Hughes, Henry R., Clinton, Oneida Co.  
Hughes, Peter, 275 Berry St., Brooklyn, Kings Co.  
Hulette, G. S., Arcade, Wyoming Co.  
Hühne, August, Rondout, Ulster Co. Founder.  
Hühne, Frederic, Rondout, Ulster Co. Original.  
Hull, Thomas H., 55 Lee Ave., Brooklyn, Kings Co.  
Hulse, William A., Bay Shore, Suffolk Co.  
Humphrey, J. F., Saratoga Springs, Saratoga Co.  
Hunt, H. L., Orchard Park, Erie Co.  
Hunt, James G., 5 Gardner Block, Utica, Oneida Co. Original.  
Hunter, Nathaniel P., Jasper, Steuben Co.  
Huntington, Henry K., New Rochelle, Westchester Co. Original.  
Huntington, John W., Mexico, Oswego Co.  
Huntley, James F., Oneida, Madison Co.  
Hutton, M. B., Valley Falls, Rensselaer Co.  
Ilgen, Ernst, 369 Herkimer St., Brooklyn, Kings Co. Original.  
(Retired list.)  
Ingraham, Henry D., 405 Franklin St., Buffalo, Erie Co.  
Ingraham, Samuel, Palmyra, Wayne Co. Original. (Retired list.)  
Inlay, Erwin G., Saratoga Springs, Saratoga Co.  
Jackson, Albert P., Oakfield, Genesee Co. Founder.  
Jackson, Charles W., 130 W. 81st St., New York, New York Co.  
Jackson, William H., Springville, Erie Co.  
Jacobson, Nathan, 430 S. Salina St., Syracuse, Onondaga Co.  
Original.

- Jamison, John S., Hornellsville, Steuben Co. Original.
- Janeway, Edward G., 36 W. 40th St., New York, New York Co.  
Founder.
- Janvrin, J. E., 191 Madison Ave., New York, New York Co.
- Jenkins, John A., 271 Jefferson Ave., Brooklyn, E. D., Kings Co.  
Original.
- Jenkins, William T., 109 E. 26th St., New York, New York Co.
- Jewett, F. A., 282 Hancock St., Brooklyn, Kings Co.
- Jewett, Homer O., Cortland, Cortland Co. Founder.
- Johnson, George P., Mexico, Oswego Co.
- Johnson, Henry W., Hudson, Columbia Co.
- Johnson, Ianthus G., Greenfield Centre, Saratoga Co. Original.
- Johnson, Leonard M., Greene, Chenango Co. Original.
- Johnson, Parley H., Adams, Jefferson Co. Original.
- Johnson, Richard G., Amsterdam, Montgomery Co. Original.
- Johnson, Thomas M., 418 Main St., Buffalo, Erie Co. Original.
- Johnston, Henry C., New Brighton, Richmond Co.
- Johnston, N. B., Barryville, Sullivan Co.
- Jones, Allen A., 436 Franklin St., Buffalo, Erie Co.
- Jones, George H., Fowlerville, Livingston Co.
- Jones, S. Case, 21 East Ave., Rochester, Monroe Co.
- Joslin, Albert A., Martinsburgh, Lewis Co.
- Judson, A. B., 25 Madison Ave., New York, New York Co.
- Julian, John M., Pleasant Valley, Dutchess Co.
- Keefer, Charles W., Mechanicsville, Saratoga Co.
- Keith, Halbert Lyon, Upton, Mass.
- Kelley, John Devin, Lowville, Lewis Co.
- Kelly, Thomas, 357 W. 57th St., New York, New York Co.
- Kemp, William M., 267 W. 23d St., New York, New York Co.
- Kenyon, Benjamin, Cincinnatus, Cortland Co.
- Kenyon, M., King's Ferry, Cayuga Co. Original.
- Killen, Jack, Binghamton, Broome Co.
- King, Ferdinand, 149 W. 66th St., New York, New York Co.
- King, James K., Watkins, Schuyler Co.
- Kingsley, Henry F., Schoharie, Schoharie Co. Original.
- Kittridge, Charles M., Fishkill-on-Hudson, Dutchess Co. Founder.
- Klock, Charles M., St. Johnsville, Montgomery Co.
- Knapp, W. H., Binghamton, Broome Co.
- Kneeland, B. T., Dalton, Livingston Co.
- Kneeland, Jonathan S., Onondaga, Onondaga Co. Founder.  
(Retired list.)
- Kneer, F. G., 236 W. 51st St., New York, New York Co.

Knipe, George, 353 W. 24th St., New York, New York Co.

Kniskern, A. C., Mechanicsville, Saratoga Co.

Kuhn, William, Rome, Oneida Co.

LaBell, Martin J., Lewis, Essex Co.    Original.

Laird, William R., 98 Wall St., Auburn, Cayuga Co.    Original.

Lake, Albert D., Gowanda, Cattaraugus Co.

Lambert, John, Salem, Washington Co.

Landon, Newell E., Newark, Wayne Co.    Original.

Lapp, Henry, Clarence, Erie Co.

Leach, H. M., Charlton City, Massachusetts.    Original.

Leale, Charles A., 604 Madison Ave., New York, New York Co.  
 Founder.

Leaning, John K., Cooperstown, Otsego Co.    Founder.

Leffingwell, E. D., Watkins, Schuyler Co.

Leighton, N. W., 143 Taylor St., Brooklyn, E. D., Kings Co.  
 Original.

Le Roy, Irving D., Pleasant Valley, Dutchess Co.    Founder.

Lester, Elias, Seneca Falls, Seneca Co.    Founder.

Lewis, Robert, 14 E. 45th St., New York, New York Co.

Lindsay, Walter, Huntington, Suffolk Co.    Original.

Little, Albert H., 349 W. 23d St., New York, New York Co.

Little, Frank, 114 Montague St., Brooklyn, Kings Co.

Lloyd, T. Mortimer, 125 Pierrepont St., Brooklyn, Kings Co.  
 Original.

Lockwood, Charles E., 34 W. 38th St., New York, New York Co.

Lockwood, J. W., Philmont, Columbia Co.    Original.

Long, Alfred J., Whitehall, Washington Co.

Long, Ben G., 1408 Main St., Buffalo, Erie Co.

Ludlow, Ogden C., 2309 7th Ave., New York, New York Co.

Lukens, Anna, 1068 Lexington Ave., New York, New York Co.

Lusk, William T., 47 E. 34th St., New York, New York Co.  
 Founder.

Lusk, Zera J., Warsaw, Wyoming Co.

Lyman, H. C., Sherburne, Chenango Co.    Original.

Lynch, Patrick J., 216 E. 13th St., New York, New York Co.

Lyon, E. M., Plattsburgh, Clinton Co.    Founder.

Lyon, George E., Planter's Hotel, St. Louis, Mo.    Original.

Lyons, Edward L., 298 4th St., Troy, Rensselaer Co.

Lyons, G. A., New Rochelle, Westchester Co.    Original.

Macfarlane, William A., Springville, Erie Co.

MacGregor, James R., 1118 Madison Ave., New York, New York Co.

Mackenzie, J. C., 432 W. 22d St., New York, New York Co.

- Maclean, Donald, 652 Mission St., Detroit, Mich. (Non-resident.)  
Magee, Charles M., 800 South West St., Syracuse, Onondaga Co.  
Magee, Daniel, 608 Federal St., Troy, Rensselaer Co. Original.  
Maher, J. J. E., 215 W. 23d St., New York, New York Co.  
Maine, Alvah P., Webster, Monroe Co.  
Manley, Thomas H., 115 W. 49th St., New York, New York Co.  
Founder.  
Marsh, E. Frank, Fulton, Oswego Co.  
Marsh, James P., 1739 5th Ave., Troy, Rensselaer Co.  
Marshall, Francis F., 56 W. 56th St., New York, New York Co.  
Martin, John H., Otego, Otsego Co. Original.  
Martindale, F. E., Port Richmond, Richmond Co.  
Martine, Godfrey R., Glens Falls, Warren Co. Original.  
McAlpin, D. Hunter, 40 W. 40th St., New York, New York Co.  
McBurney, Charles, 28 W. 37th St., New York, New York Co.  
McCollom, William, 195 Lefferts Place, Brooklyn, Kings Co.  
Original.  
McDaniel, Alfred C., San Antonio, Texas. (Non-resident.)  
McDonald, George E., Schenectady, Schenectady Co. Original.  
McDougall, R. A., Duaneburg, Schenectady Co.  
McDougall, William D., Spencerport, Monroe Co. (San Jose, Cal.)  
McGann, Thomas, Wells, Hamilton Co.  
McGillicuddy, T. J., 776 Madison Ave., New York, New York Co.  
McGowen, John P., 109 E. 28th St., New York, New York Co.  
McIlroy, Samuel H., 330 Alexander Ave., New York, New York Co.  
McLeod, Johnston, 247 W. 23d St., New York, New York Co.  
McLeod, S. B. Wylie, 247 W. 23d St., New York, New York Co.  
Founder.  
McLochlin, James A., 157 W. 21st St., New York, New York Co.  
Original.  
McNamara, Daniel, 243 W. Genesee St., Syracuse, Onondaga Co.  
Original.  
McNamara, Laurence J., 126 Washington Place (West), New York,  
New York Co. Original.  
McNicholl, Thomas A., 321 E. 50th St., New York, New York Co.  
McWilliams, F. A., Monticello, Sullivan Co.  
Meacham, Isaac D., Binghamton, Broome Co.  
Meier, Gottlieb C. H., 126 E. 58th St., New York, New York Co.  
Menzie, R. J., Caledonia, Livingston Co. Original.  
Merritt, George, Cherry Valley, Otsego Co. Original.  
Meyer, George L., Stone Arabia, Montgomery Co.  
Michael, F. M., Binghamton, Broome Co.



- Milbury, Frank S., 215 Jefferson Ave., Brooklyn, Kings Co.  
 Miles, George W., Oneda, Madison Co.  
 Miller, William T., 310 W. 27th St., New York, New York Co. Original.  
 Milliken, S. E., 72 W. 49th St., New York, New York Co.  
 Minard, E. J. Chapin, 243 Quincy St., Brooklyn, Kings Co. Original.  
 Miranda, Ramon L., 349 W. 46th St., New York, New York Co. Original.  
 Mitchell, Hubbard W., 747 Madison Ave., New York, New York Co. Original.  
 Montgomery, J. J., Luzerne, Warren Co.  
 Moore, Edward M., 74 S. Fitzhugh St., Rochester, Monroe Co. Founder.  
 Moore, Edward M., Jr., 74 S. Fitzhugh St., Rochester, Monroe Co. Original.  
 Moore, Richard Mott, 74 S. Fitzhugh St., Rochester, Monroe Co. Original.  
 Moore, William A., Binghamton, Broome Co.  
 Moran, James, 352 W. 51st St., New York, New York Co.  
 Morehouse, E. W., 199 2d St., Troy, Rensselaer Co.  
 Moriarta, Douglas C., Saratoga Springs, Saratoga Co.  
 Morrow, William B., Walton, Delaware Co.  
 Mott, Valentine, 62 Madison Ave., New York, New York Co.  
 Moyer, Frank H., Moscow, Livingston Co. Original.  
 Mudge, Selden J., Olean, Cattaraugus Co.  
 Muir, William Scott, Truro, Nova Scotia. (Non-resident.)  
 Munger, Charles, Knoxborough, Oneida Co.  
 Munson, J. A., Woodbourne, Sullivan Co. Original.  
 Munson, W. W., Otisco, Onondaga Co. Original.  
 Murdoch, James Bissett, 4232 5th Ave., Pittsburgh, Pa. (Non-resident.)  
 Murdock, George W., Cold Spring, Putnam Co. Founder.  
 Murphy, John, 249 E. 35th St., New York, New York Co. Original.  
 Murray, Byron J., Saratoga Springs, Saratoga Co. Original.  
 Murray, S. J., 133 W. 87th St., New York, New York Co. Original.  
 Murray, William D., Tonawanda, Erie Co. Original.  
 Nelson, William H., Taberg, Oneida Co.  
 Newman, George W., 234 Leonard St., Brooklyn, Kings Co.  
 Newman, Robert, 64 W. 36th St., New York, New York Co. Original.  
 Nichols, Calvin E., 25 1st St., Troy, Rensselaer Co. Founder.

- \*Nichols, H. W., Canandaigua, Ontario Co. Founder. (Retired list.)  
Nichols, William H., West Sand Lake, Rensselaer Co. Founder.  
Nicholson, A. R., Madison, Madison Co. Original.  
Nicoll, Henry D., 51 E. 57th St., New York, New York Co. Founder.  
Nold, John B., Utica, Oneida Co. (Retired list.)  
North, Nelson L., 627 Bedford Ave., Brooklyn, Kings Co. Original.  
Noyes, James B., New Berlin, Chenango Co.  
Nutton, Wilbur F., Newark, Wayne Co.  
Obendorfer, Isidor P., 1037 Lexington Ave., New York, New York Co. Original.  
O'Brien, Frederick Wm., 244 Lenox Ave., New York, New York Co.  
O'Brien, M. Christopher, 161 W. 122d St., New York, New York Co.  
Ochs, Benjamin F., 120 W. 120th St., New York, New York Co.  
O'Hare, Thomas A., 157 State St., Rochester, Monroe Co. Original.  
Oliver, William, Penn Yan, Yates Co.  
\*O'Meagher, William, 427 E. 84th St., New York, New York Co.  
Oppenheimer, H. S., 49 E. 23d St., New York, New York Co.  
Oppenheimer, S., 55 E. 65th St. (The Palacio), New York, New York Co.  
Orton, John G., Binghamton, Broome Co. Founder.  
Ostrander, George A., 61 Greene Ave., Brooklyn, Kings Co.  
Packer, Thurston G., Smyrna, Chenango Co.  
Page, Emmett D., 297 De Kalb Ave., Brooklyn, Kings Co.  
Paine, Arthur R., 99 Lafayette Ave., Brooklyn, Kings Co. Original.  
Painter, Henry McM., 600 Madison Ave., New York, New York Co.  
Palmer, Edmund J., 1342 Lexington Ave., New York, New York Co.  
Palmer, F. A., Mechanicsville, Saratoga Co.  
Palmer, George M., Warsaw, Wyoming Co. Original.  
Palmer, Henry C., cor. Genesee and Hopper Sts., Utica, Oneida Co.  
Palmer, Walter B., 30 South St., Utica, Oneida Co.  
Parent, J. S., Birchtown, Saratoga Co.  
Park, Roswell, 510 Delaware Ave., Buffalo, Erie Co.  
Park, Wm. Hallock, 128 W. 11th St., New York, New York Co.  
Parker, Ransom J., 130 Lexington Ave., New York, New York Co.  
Parkhill, C. S., Hornellsville, Steuben Co.  
Parr, John, Buel, Montgomery Co.  
Parsons, Israel, Marcellus, Onondaga Co. Founder.  
Parsons, John, Kingsbridge, New York, New York Co. Original.  
Parsons, W. W. D., Fultonville, Montgomery Co.  
Pease, Joseph, Hamlin, Monroe Co. Original.

- Peele, Francis, 220 Schermerhorn St., Brooklyn, Kings Co.  
Perry, John Gardner, 48 E. 34th St., New York, New York Co.  
Peters, Samuel, 86 Mohawk St., Cohoes, Albany Co. Founder.  
Pettit, John A., 519 Swan St., Buffalo, Erie Co. Original.  
Phelan, M. Francis, 25 Thirteenth St., Troy, Rensselaer Co.  
Phelps, Charles, 34 W. 37th St., New York, New York Co.  
Phelps, George G., 239 Blandina St., Utica, Oneida Co.  
Phelps, William C., 146 Allen St., Buffalo, Erie Co.  
Pierce, Edward A., Binghamton, Broome Co.  
Pierson, George E., Kirkwood, Broome Co. (Retired list.)  
Piper, Charles W., Wurtsborough, Sullivan Co.  
Place, John F., Jr., Binghamton, Broome Co.  
Pohlman, Julius, 382 Franklin St., Buffalo, Erie Co.  
Pooler, Hiram A., 34 Gramercy Park, New York, New York Co.  
Original. (Retired list.)  
\*Porteous, James G., Poughkeepsie, Dutchess Co. Founder.  
Porter, H. N., 1910 Harewood Ave., Washington, D. C. Founder.  
(Retired list.)  
Porter, P. B., 8 W. 35th St., New York, New York Co. Original.  
Potter, E. Styles, 64 W. 55th St., New York, New York Co.  
Potter, Vaughn C., Starkville, Herkimer Co. Original.  
Potts, E., Port Jervis, Orange Co.  
Pratt, Frank R., Manchester, Ontario Co.  
Pray, S. R., 191 South 9th St., Brooklyn, Kings Co. Original.  
Preston, John R., Schuylerville, Saratoga Co. Original.  
Price, Henry R., 485 Franklin Ave., Brooklyn, Kings Co.  
Prince, Alpheus, Byron, Genesee Co.  
Pritchard, R. L., 72 W. 49th St., New York, New York Co.  
Pryor, William R., 15 Park Ave., New York, New York Co.  
Pultz, Monroe T., Stanfordville, Dutchess Co. Founder.  
Purple, S. S., 36 W. 22d St., New York, New York Co. Founder.  
Putnam, Frederick W., Binghamton, Broome Co. Founder.  
Race, W. F., 115 W. 25th St., Kearney, Neb. Original.  
Rae, Robert, Portageville, Wyoming Co. Original.  
\*Ransom, H. B. (in care S. V. White & Co.) 36 Wall St., New York,  
New York Co.  
Rau, Leonard S., 72 W. 55th St., New York, New York Co.  
Rave, Edward G., Hicksville, Queens Co. Original.  
Raynor, F. C., 163 Clinton St., Brooklyn, Kings Co.  
Read, Ira B., 2074 Fifth Ave., New York, New York Co.  
Reagles, James, Schenectady, Schenectady Co. Original.

\* Deceased.

- Reed, Albert, Highland, Ulster Co.  
Reed, Henry B., 12 Verona Place, Brooklyn, Kings Co.  
Reese, Frank D., Cortland, Cortland Co.  
Reid, Christopher C., Rome, Oneida Co.  
Reitz, Charles, Webster, Monroe Co.  
Reynolds, Tabor B., Saratoga Springs, Saratoga Co. Founder.  
Richards, Charles B., Binghamton, Broome Co. Founder.  
Richardson, John E., 127 S. Oxford St., Brooklyn, Kings Co.  
Richmond, Nelson G., Fredonia, Chautauqua Co.  
Ricketts, Benjamin M., 137 Broadway, Cincinnati, O. Original.  
Riley, Andrew W., 207 S. 16th St., Omaha, Neb. Original.  
Risch, Henry F. W., 521 3d St., Brooklyn, Kings Co.  
Robb, William H., Amsterdam, Montgomery Co. Founder.  
Robinson, Ezra A., Geneva, De Kalb Co., Ill. Original.  
Rochester, DeLancey, 469 Franklin St., Buffalo, Erie Co.  
Rochester, Thomas M., 326 De Kalb Ave., Brooklyn, Kings Co.  
Rodgers, Harris C., 1 Wall St., Binghamton, Broome Co.  
Rogers, S. Frank, 3161 6th Ave., Troy, Rensselaer Co. Original.  
Rolph, R. T., Fredonia, Chautauqua Co.  
Roper, P. B., Alpine, Schuyler Co.  
Ross, Frank W., 251 Baldwin St., Elmira, Chemung Co. Original.  
Roth, Julius A., 308 E. 79th St., New York, New York Co.  
Rousseau, Zotique, 99 2d St., Troy, Rensselaer Co. Founder.  
Rudgers, Denton W., Hornellsville, Steuben Co.  
Ruggles, Augustus D., 2061 Madison Ave., New York, New York Co.  
Rulison, L. B., West Troy, Albany Co.  
Rushmore, J. D., 129 Montague St., Brooklyn, Kings Co. Founder.  
Russell, Charles P., 198 Genesee St., Utica, Oneida Co.  
Russell, Wm. G., 27 McDonough St., Brooklyn, Kings Co. Original.  
Sabal, E. T., 45 W. Monroe St., Jacksonville, Fla. (Non-resident.)  
Sabin, Wm. B., 1425 Broadway, West Troy, Albany Co. Founder.  
Sabine, G. A., 43 E. 68th St., New York, New York Co. Original.  
Sanders, E., 126 E. 82d St., New York, New York Co.  
Sawyer, Conant, Auburn, Cayuga Co. Founder.  
Saxer, L. A., 514 Prospect Ave., Syracuse, Onondaga Co. Original.  
Sayre, Lewis A., 285 5th Ave., New York, New York Co. Founder.  
Sayre, Reginald H., 285 5th Ave., New York, New York Co.  
Schmid, H. Ernst, White Plains, Westchester Co. Original.  
Schopp, Justin H., 127 E. Main St., Rochester, Monroe Co.  
Scully, Thomas P., Rome, Oneida Co.  
Seaman, Louis L., 18 W. 31st St., New York, New York Co.  
Seaman, Frank G., Seneca Falls, Seneca Co.

Sears, F. W., 326 Montgomery St., Syracuse, Onondaga Co.  
 Segur, Avery, 281 Henry St., Brooklyn, Kings Co. Founder.  
 (Retired list.)

\*Selden, O. G., Catskill, Greene Co. Original.

Selden, Robert, Catskill, Greene Co. Original.

Seymour, Ralph A., Whitney's Point, Broome Co.

Seymour, W. Wotkyns, 105 3d St., Troy, Rensselaer Co. Founder.

Sharer, John P., Little Falls, Herkimer Co. Original.

Shaw, Henry B., 21 E. 127th St., New York, New York Co.

Shea, Dennis L., 116 Waverly Place, New York, New York Co.

Shepard, A. W., 126 Willoughby St., Brooklyn, Kings Co. Original.

Sherer, John D., Waterford, Saratoga Co. Original.

Sherman, F. J., Ballston, Saratoga Co.

Shrady, John, 149 W. 126th St., New York, New York Co.

Shrady, John Eliot, 149 W. 126th St., New York, New York Co.

Silver, Henry M., 105 W. 72d St., New York, New York Co.

Simmons, Charles E., 762 Madison Ave., New York, New York Co.

Simmons, E. W., Canandaigua, Ontario Co. Founder. (Retired list.)

Simons, Frank E., Canajoharie, Montgomery Co.

Sizer, Nelson Buell, 336 Green Ave., Brooklyn, Kings Co. Original.

Skinner, Smith A., Hoosick Falls, Rensselaer Co. Original.

(Retired list.)

Slater, Frank Ellsworth, Binghamton, Broome Co.

Small, John W., North Tarrytown, Westchester Co.

Smelzer, Baxter T., Havana, Schuyler Co.

Smith, Alexander H., 40 W. 47th St., New York, New York Co.

Smith, Edward L., Binghamton, Broome Co.

Smith, F. A., Corinth, Saratoga Co.

Smith, Frederick A., 3 Clinton Place, Troy, Rensselaer Co.

Smith, George C., Delhi, Delaware Co.

Smith, H. Lyle, Hudson, Columbia Co. Original.

Smith, J. Lewis, 64 W. 56th St., New York, New York Co. Original.

Smith, Samuel L., Smithville Flats, Chenango Co.

Smith, Samuel W., Hotel San Remo, 75th St., New York, New York Co. Original.

Smith, Stephen, 574 Madison Ave., New York, New York Co. Original.

Smyth, Arthur V. H., Amsterdam, Montgomery Co.

Snook, George M., Parma, Monroe Co.

Southworth, Malek A., San Jose, Cal. Original.

\* Deceased.



- Southworth, Richmond Joseph, 1220 36th St., N. W., Washington,  
D. C. Original. (Retired list.)
- Spicer, Walter E., 62 Charlton St., New York, New York Co.
- Sprague, John A., Williamson, Wayne Co. Original.
- Sprague, L. S., Williamson, Wayne Co. (Retired list.)
- Squibb, Edward H., 148 Columbia Heights, Brooklyn, Kings Co.  
Founder. (P. O. Box 760.)
- Squibb, Edward R., 152 Columbia Heights, Brooklyn, Kings Co.  
Founder.
- Squire, Charles L., 409 E. Church St., Elmira, Chemung Co.
- Stearns, Benjamin W., Long Eddy, Sullivan Co.
- Steinke, Carl Otho Hermann, 220 17th St., Brooklyn, Kings Co.  
Original.
- Stewart, F. E., West Broadway and Franklin Sts., New York, New  
York Co.
- Stewart, George D., 130 E. 36th St., New York, New York Co.
- St. John, David, Havensack, N. J. (Non-resident.)
- Stockschlaeder, P., 186 South Ave., Rochester, Monroe Co.
- Stockton, Charles G., 436 Franklin St., Buffalo, Erie Co.
- Stone, Frank L., LeRoy, Genesee Co.
- Strong, Cyrus J., 49 W. 35th St., New York, New York Co.
- Strong, Orville C., Colden, Erie Co.
- Strong, Thomas D., Westfield, Chautauqua Co. Founder.
- Stubbs, Roland H., Waterford, Saratoga Co. Original.
- Sullivan, John D., 74 McDonough St., Brooklyn, Kings Co.
- Sutton, H. C., Rome, Oneida Co.
- Sutton, Richard E., Rome, Oneida Co.
- Swan, William E., Saratoga Springs, Saratoga Co.
- Swanick, A. A., Saratoga Springs, Saratoga Co.
- Swartwout, H. B., Port Jervis, Orange Co.
- Swartwout, Leander, Prospect, Oneida Co.
- Sweeney, James M., 78 Varick St., Utica, Oneida Co.
- Sweet, Joseph J., Unadilla, Otsego Co. Original.
- Sweet, Joshua J., Unadilla, Otsego Co.
- Sweetman, J. T., Jr., Ballston, Saratoga Co.
- Syms, Parker, 60 W. 47th St., New York, New York Co.
- Taber, R. C., Tonawanda, Erie Co.
- Taylor, John H., Holley, Orleans Co. Original.
- Tefft, Charles B., Room 20, Arcade, Utica, Oneida Co.
- Thayer, William Henry, Berkshire, Mass. (Retired list.)
- Thomas, T. Gaillard, 600 Madison Ave., New York, New York Co.  
Founder.

- Thompson, R. A., Norwich, Chenango Co.  
Thompson, Amos W., Saratoga Springs, Saratoga Co.  
Thompson, Von Beverhout, 111 W. 43d St., New York, New York Co.  
Thornton, William H., 572 Niagara St., Buffalo, Erie Co.  
Thwing, Clarence, Ft. Wrangel, Alaska.  
Tiemann, Paul E., 180 W. 94th St., New York, New York Co.  
Todd, John B., Parish, Oswego Co.  
Tompkins, Fred J., 128 2d Ave., Lansingburgh, Rensselaer Co.  
Tompkins, H. C., Knowlesville, Orleans Co. Founder. (Retired list.)  
Tompkins, Orren A., East Randolph, Cattaraugus Co. Original.  
Townsend, Charles E., Broadway and Grand Sts., Newburgh, Orange Co.  
Townsend, Morris W., Bergen, Genesee Co. Founder.  
\* Traver, Richard D., 14 4th St., Troy, Rensselaer Co. Original.  
Travis, Edward M., Eagle Grove, Iowa.  
Tremaine, Wm. S., 217 Franklin St., Buffalo, Erie Co. Founder.  
Tripp, John D., Auburn, Cayuga Co. Original.  
Truax, J. G., 17 E. 127th St., New York, New York Co.  
Trull, H. P., Williamsville, Erie Co.  
Tucker, Carlos P., 43 W. 26th St., New York, New York Co. Founder.  
Turner, Melvin H., Mineville, Essex Co. Original.  
Twohey, John J., 170 E. Utica St., Buffalo, Erie Co.  
Vanderhoof, Frederick D., Phelps, Ontario Co. Original.  
Vanderveer, J. C., Monroe, Orange Co.  
Vanderveer, J. R., Monroe, Orange Co.  
Van de Warker, Ely, 404 Fayette Park, Syracuse, Onondaga Co. Founder.  
Van Etten, Cornelius S., Rhinebeck, Dutchess Co.  
Van Fleet, Frank, 116 E. 82d St., New York, New York Co.  
Van Hoevenberg, Henry, Kingston, Ulster Co. Original.  
Van Vranken, Adam T., 1603 3d Ave., West Troy, Albany Co. Original.  
Van Wagner, L. A., Sherburne, Chenango Co.  
\* Van Wyck, Richard C., Hopewell Junction, Dutchess Co. Original.  
Van Zandt, Henry C., Schenectady, Schenectady Co. Original.  
Varney, Miles E., Saratoga Springs, Saratoga Co.  
Vedder, George W., Philmont, Columbia Co.  
Veeder, Andrew T., 93 Fifth Ave., Pittsburgh, Pa.

- Von Dönhoff, Edward, 210 W. 4th St., New York, New York Co.  
Vincent, Ludger C., 350 W. 58th St., New York, New York Co.  
Wakely, Benjamin C., Angelica, Alleghany Co. Original.  
Wales, Theron A., Elmira, Chemung Co. Original.  
Walker, James E., Hornellsville, Steuben Co.  
Wall, Charles A., 306 Hudson St., Buffalo, Erie Co.  
Wallace, Edwin E., Jasper, Steuben Co.  
Wallach, Joseph G., 7 W. 82d St., New York, New York Co.  
Original.  
Walser, William C., West New Brighton, Richmond Co.  
Walsh, Simon J., 25 E. 128th St., New York, New York Co.  
Ward, Charles S., 30 W. 33d St., New York, New York Co. Founder.  
Ward, John J., Ellenville, Ulster Co.  
Ward, R. H., 53 4th St., Troy, Rensselaer Co.  
Warner, John W., 107 E. 72d St., New York, New York Co.  
Waterworth, William, 3 Hancock St., Brooklyn, Kings Co.  
Webster, W. B., Schuylerville, Saratoga Co.  
Weeks, John E., 154 Madison Ave., New York, New York Co.  
Welles, S. R., Waterloo, Seneca Co. (Retired list.)  
Wells, E. H., Binghamton, Broome Co.  
Wells, William L., New Rochelle, Westchester Co. Original.  
West, Joseph E., 171 Genesee St., Utica, Oneida Co.  
Weston, Albert T., 226 Central Park West, between 82d and 83d  
Sts., New York, New York Co.  
Wheeler, Isaac G., Marilla, Erie Co.  
Wheeler, John T., Chatham, Columbia Co.  
Whipple, Electa B., 491 Porter Ave., Buffalo, Erie Co.  
White, Charles B., 107 W. 72d St., New York, New York Co.  
White, J. Blake, 1013 Madison Ave., New York, New York Co.  
White, Whitman V., 114 E. 85th St., New York, New York Co.  
Founder.  
White, William A., Binghamton, Broome Co.  
Whitford, James, Onondaga Valley, Onondaga Co. Original.  
\* Wieber, George, 181 S. 5th St., Brooklyn, Kings Co. Original.  
Wiener, Joseph, 1046 5th Ave., New York, New York Co. Founder.  
Wiggin, Frederick Holme, 55 W. 36th St., New York, New York Co.  
Williams, George O., Green, Chenango Co.  
Williams, Henry Smith, 165 W. 82d St., New York, New York Co.  
Williams, William H., 207 17th St., Brooklyn, Kings Co. Original.  
Willoughby, M., 1335 Main St., Buffalo, Erie Co.  
Wilson, Thomas, Claverack, Columbia Co. Founder.

Whitbeck, Charles E., Cohoes, Albany Co.  
 Woodend, Wm. E., 1969 Madison Ave., New York, New York Co.  
 Woodruff, E. Gould, Auburn, Cayuga Co.  
 Woodruff, R. Allen, Philmont, Columbia Co.  
 Woodworth, T. Floyd, Kinderhook, Columbia Co.  
 Wright, Jonathan, 73 Remsen St., Brooklyn, Kings Co.  
 Wright, Theodore Goodell, Plainville, Hartford Co., Conn. (Non-resident.)  
 Wyckoff, C. C., 482 Delaware Ave., Buffalo, Erie Co. Founder.  
 Wyckoff, R. M., 532 Clinton Ave., Brooklyn, Kings Co. Founder.  
 Wyeth, J. A., 27 E. 38th St., New York, New York Co. Original.  
 Yankauer, Sidney, 207 E. 57th St., New York, New York Co.  
 Young, Augustus A., Newark, Wayne Co. Original.  
 Young, John D., Starkville, Herkimer Co. Original.  
 Young, Wm., Cold Spring, Putnam Co. Founder. (Retired list.)  
 Zeh, Edgar, Waterford, Saratoga Co.  
 Zeh, Merlin J., 1521 Broadway, West Troy, Albany Co.

Of 164 Founders, 100 remain on the list; of 286 Original Fellows, 206 remain on the list. Total Fellowship, 800.

#### RETIRED FELLOWS.

Charles G. Bacon, Fulton, Oswego County (1891).  
 M. M. Bagg, Utica, Oneida County (1891).  
 George B. Banks, Hartsdale, Westchester County (1892).  
 Lyman Barton, Willsborough, Essex County (1890).  
 F. R. Bentley, Cheshire, Ontario County (1891).  
 William N. Bonesteel, Troy, Rensselaer County (1890).  
 Alonzo Churchill, Utica, Oneida County (1890).  
 C. L. Dayton, Buffalo, Erie County (1891).  
 W. H. Flint, Ridgefield, Conn. (1895).  
 Philip DuB. HoornBeek, Wawarsing, Ulster County (1891).  
 Ernst Ilgen, 360 Herkimer St., Brooklyn, Kings County (1895).  
 Samuel Ingraham, Palmyra, Wayne County (1890).  
 Jonathan S. Kneeland, Onondaga County (1890).  
 \*H. W. Nichols, Canandaigua, Ontario County (1893).  
 John B. Nold, Utica, Oneida County (1894).  
 George E. Pierson, Kirkwood, Broome County (1895).  
 H. A. Pooler, 34 Gramercy Park, New York, New York County (1892).  
 H. N. Porter, Washington, D. C. (1891).

\* Deceased.

Avery Segur, 281 Henry St., Brooklyn, Kings County (1893).  
E. W. Simmons, Canandaigua, Ontario County (1892).  
S. A. Skinner, Hoosick Falls, Rensselaer County (1895).  
R. J. Southworth, Washington, D. C. (1894).  
L. S. Sprague, Williamson, Wayne County (1891).  
W. H. Thayer, Berkshire, Mass. (1895).  
H. C. Tompkins, Knowlesville, Orleans County (1893).  
S. R. Welles, Waterloo, Seneca County (1894).  
William Young, Cold Spring, Putnam County (1891).

## NON-RESIDENT FELLOWS.

N. P. Dandridge, 148 Broadway, Cincinnati, Ohio.  
Stuart Eldridge, Yokohama, Japan.  
Alfred C. McDaniel, San Antonio, Texas.  
Donald Maclean, 652 Mission St., Detroit, Mich.  
William Scott Muir, Truro, Nova Scotia.  
James Bissett Murdoch, 4232 Fifth Ave., Pittsburgh, Pa.  
E. T. Sabal, 45 W. Monroe St., Jacksonville, Fla.  
David St. John, Hackensack, N. J.  
Theodore Goodell Wright, Plainville, Hartford Co., Conn.

## CORRESPONDING FELLOW.

Henry O. Marcy, 180 Commonwealth Ave., Boston, Mass. (1890).



# DECEASED FELLOWS.

NAME.	AGE. <sup>1</sup>	COUNTY.	PLACE OF BIRTH.	DATE OF DEATH.	MEDICAL COLLEGE.	YEAR OF GRADUATION.
Abell, Ira H. (F) <sup>1</sup>	71	Jefferson	Fairfield, Vt. . . . .	April 29, 1894.	Vermont Med. Coll. . . . .	1844
Adams, John G. (F)	77	New York	New York City . . . . .	June 19, 1884.	Coll. Phys. and Surg., N. Y.	1830
Allaben, O. M. (O) <sup>2</sup>	83	Delaware	Delaware Co., N. Y. . . .	Nov. 27, 1891.	Woodstock, Vt. . . . .	1831
Andrews, John S. (O)	61	Kings	Bristol, Conn. . . . .	Jan. 3, 1889.	Univ. City of New York . .	1849
Andrews, Judson B. (F)	60	Erie	North Haven, Conn. . . .	Aug. 3, 1894.	Yale Med. School . . . . .	1863
Ashton, Isaiah H. . . . .	39	Westchester	Philadelphia, Pa. . . . .	Feb. 16, 1889.	University of Pennsylvania	1870
Avery, George W. (F)	61	Chenango	Earlville, N. Y. . . . .	Nov. 1, 1888.	Albany Medical College . .	1850
Ayres, Alexander (F)	74	Montgomery	Oppenheim, N. Y. . . . .	Aug. 27, 1886.	Castleton, Vt. . . . .	1842
Babcock, Myron N. (F)	73	Saratoga	West Berkshire, Vt. . . .	May 21, 1892.	Vermont Medical College .	1842
Ballou, William R. . . . .	29	New York	Bath, Me. . . . .	March 9, 1893.	Bellevue Hosp. Med. Coll.	1886
Barker, A. M. (O)	37	Erie	Kendall, Orleans Co., N. Y.	Dec. 6, 1887.	University of Buffalo . . .	1877
Bathgate, James (O)	65	New York	New York . . . . .	March 27, 1891.	Coll. Phys. and Surg., N. Y.	1846
Baynes, William T. (O)	48	Rensselaer	England . . . . .	Jan. 22, 1892.	Albany Medical College . .	1871
Bemus, William P. . . . .	63	Chautauqua	Chautauqua Co. . . . .	Sept. 19, 1890.	Berkshire Medical College	1847
Blakeman, William N. (O)	85	New York	Roxbury, Conn. . . . .	Aug. 10, 1890.	Yale . . . . .	1832
Buckley, Charles (O)	..	Monroe	. . . . .	. . . . .	University of Pennsylvania	1870
Bucklin, Daniel D. (O)	70	Rensselaer	Brunswick, N. Y. . . . .	April 19, 1890.	Albany Medical College . .	1846
Budd, J. Henry (O)	45	Ontario	United States . . . . .	Feb. 25, 1890.	Buffalo Medical College . .	1875
Burton, M. H. (F)	62	Rensselaer	Albany, N. Y. . . . .	April 28, 1895.	Albany Medical College . .	1863
Burwell, George N. (O)	72	Erie	Norway, Herkimer Co. . .	May 15, 1891.	University of Pennsylvania	1843
Carroll, Alfred Ludlow (F)	60	New York	New York City . . . . .	Oct. 30, 1893.	Univ. City of New York . .	1855
Case, Mary W. . . . .	33	Rensselaer	New York State . . . . .	Aug. 19, 1889.	Woman's Med. Coll., Phila.	1882

<sup>1</sup> (F) Founder. <sup>2</sup> (O) Original Fellow.

Chace, William (F)	58	Chautauqua	St. Catharine's, Canada	Dec. 27, 1891.	Coll. Phys. and Surg., N. Y.	1858
Church, Allen S. (F)	62	New York	Great Barrington, Mass.	Oct. 24, 1884.	Castleton, Vt.	1848
Clark, Alonzo	80	New York	Chester, Mass.	Sept. 13, 1887.	Coll. Phys. and Surg., N. Y.	1835
Clark, Simeon T. (O)	55	Niagara	Canton, Mass.	Dec. 24, 1891.	Berkshire Med. Coll.	1860
Cott, William N. (F)	52	Clinton	Plattsburgh, N. Y.	Aug. 4, 1886.	University of Pennsylvania	1856
Collins, Isaac G. (F)	53	Westchester	Granville, N. Y.	Dec. 18, 1885.	Albany Medical College	1858
Collins, Thomas B. (O)	61	Monroe	Mendon, N. Y.	Feb. 17, 1888.	Jefferson Med. Coll., Phila.	1851
Cooper, William S. (F)	70	Rensselaer	Scotland	May 26, 1890.	Albany Medical College	1860
Cornell, F. O. (O)	29	Montgomery	Glenville, N. Y.	Dec. 3, 1884.	Albany Medical College	1880
Cotes, J. R.	54	Genesee	Batavia, N. Y.	March 20, 1884.	Med. Dep. Univ. Buffalo	1852
Creamer, Joseph	63	Kings	Halifax, Nova Scotia	Jan. 6, 1893.	Coll. Phys. and Surg., N. Y.	1850
Cruttenden, Albert G.	75	Ontario	Covington, N. Y.	June 7, 1890.	Willoughby Univ., Ohio	1840
Damainville, Lucien	52	New York	Erie, Pa.	Dec. 15, 1891.	Long Island Coll. Hosp.	1860
Davidson, John (F)	91	Queens	New York City	Dec. 26, 1884.	Lic. N. Y. St. Med. Soc.	1829
De La Mater, S. G. (F)	73	Schenectady	Bethlehem, Alb. Co., N. Y.	June 23, 1888.	Albany Medical College	1842
Du Bois, Abram (F)	81	New York	Red Hook, N. Y.	Aug. 29, 1891.	Coll. Phys. and Surg., N. Y.	1835
Eager, William B. (O)	65	Orange	Orange Co.	Jan. 18, 1890.	Coll. Phys. and Surg., N. Y.	1848
Earl, George W. (F)	53	Onondaga	Mottville, N. Y.	July 8, 1890.	Buffalo Medical College	1858
Edgerly, Edward F. (F)	50	Essex	Mortiah, Essex Co.	June 23, 1889.	Albany Medical College	1864
Elder, Jennie S.	32	Onondaga	Syracuse, N. Y.	Feb. 2, 1889.	Med. Dep. Syracuse Univ.	1878
Ferguson, James (O)	74	Warren	Kortwright, N. Y.	Oct. 27, 1892.	Castleton, Vt.	1841
Field, M. D.	41	New York	Nashville, Tenn.	March 8, 1895.	Bellevue Hosp. Med. Coll.	1879
Fitch, William (F)	70	Tompkins	Franklin, N. Y.	Sept. 14, 1893.	Albany Medical College	1846
Flint, Austin (F)	73	New York	Petersham, Mass.	March 13, 1886.	Harvard Medical College	1833
Flood, Patrick Henry (O)	72	Chemung	Pennsylvania	March 12, 1886.	Geneva Medical College	1845
Fox, Eli	57	Herkimer	Columbia, N. Y.	Oct. 13, 1890.	Med. Dep. Univ. City N. Y.	1855
Fuller, Winfield S. (O)	48	Monroe	Walworth, N. Y.	Jan. 13, 1888.	Coll. Phys. and Surg., N. Y.	1861
Fuller, Robert	72	Schenectady	Schenectady, N. Y.	May 9, 1894.	Albany Med. Coll.	1875

DECEASED FELLOWS.—*Continued.*

NAME.	AGE.	COUNTY.	PLACE OF BIRTH.	DATE OF DEATH.	MEDICAL COLLEGE.	YEAR OF GRADUATION.
Garrison, John P. (O)	76	New York	New Brunswick, N. J.	April 1, 1891.	Jefferson Med. Coll., Phila.	1836
Gay, Charles C. F. (F)	66	Erie	Pittsfield, Mass.	March 27, 1886.	Berkshire Medical College	1846
Gillis, William (F)	72	Franklin	Cornwall, Can.	Feb. 17, 1894.	Castleton, Vt.	1849
Goldthwaite, Henry	52	New York	Mobile, Ala.	Jan. 3, 1895.	Bellevue Hos. Med. Coll.	1876
Govan, William (F.)	65	Rockland	Barnet, Vt.	March 22, 1894.	New York Med. Coll.	1854
Gray, John Perdue (F)	61	Oneida	Half Moon, Pa.	Nov. 29, 1886.	University of Pennsylvania	1849
Gray, John W. (F)	53	Livingston	America	April 17, 1886.	University of New York	1856
Green, Caleb (F)	73	Cortland	La Fayette, N. Y.	May 10, 1893.	Geneva Medical College	1844
Griswold, Gaspar (O)	29	New York	New York City	March 4, 1886.	Bellevue Hosp. Med. Coll.	1878
Guernsey, Desault (F)	55	Dutchess	Wilton, N. Y.	Dec. 9, 1885.	Coll. Phys. and Surg., N. Y.	1850
Hall, H. C. (O)	41	Broome	America	June 1, 1887.	University of New York	1869
Hall, John E. (O)	38	Albany	New Marlboro', Mass.	Nov. 3, 1886.	Albany Medical College	1877
Hamilton, Frank H. (F)	73	New York	Wilmington, Vt.	Aug. 11, 1886.	University of Pennsylvania	1835
Higgins, Seabury M. (O)	67	Onondaga	Brewster, Mass.	Dec. 9, 1889.	University City of N. Y.	1848
Hinds, Frederic J. (O)	32	Washington	East Greenwich, N. Y.	April 26, 1887.	Bellevue Hosp. Med. Coll.	1876
Hogan, Michael K.	64	New York	County Clare, Ireland	Feb. 25, 1894.	Coll. Phys. and Surg., N. Y.	1858
Hollister, Edwin O. (O)	41	Ontario	Batavia, N. Y.	Oct. 8, 1887.	Bellevue Hosp. Med. Coll.	1874
Hubbard, George E.	86	New York	Natural Bridge, N. Y.	March 23, 1893.	Med. Dep. Univ. City, N. Y.	1883
Hubbard, Samuel T. (F.)	36	New York	Haddam, Conn.	June 1, 1894.	Coll. Phys. and Surg., N. Y.	1835
Hull, William H.	....	Rensselaer	Petersburgh, N. Y.	Dec. 1, 1894.	Albany Med. Coll.	1866
Hunt, James H. (O)	44	Orange	Centreville, Sullivan Co.	Dec. 20, 1892.	Bellevue Hosp. Med. Coll.	1872
Husted, N. C. (F)	66	Westchester	Round Hill, Conn.	Nov. 19, 1891.	University City of N. Y.	1850

Hutchison, Joseph C. (F)	60	Kings . . .	Old Franklin, Mo. . .	July 17, 1887.	University of Pennsylvania	1848
Hyde, Frederick (F)	80	Cortland . .	Whitney Point, N. Y. .	Oct. 15, 1887.	Fairfield Medical College .	1836
Johnston, Francis U. (F)	66	Richmond . .	New York City . . .	Nov. 20, 1892.	Coll. Phys. and Surg., N. Y. .	1852
King, James E. (O)	66	Erie . . .	Warren, Pa. . . .	Jan. 21, 1888.	Buffalo Medical College .	1848
Knapp, Edwin A. (O)	67	Onondaga . .	New York State . . .	Dec. 7, 1890.	Geneva Med. Coll. . . .	1851
Knapp, John H. (O)	67	Cortland . .	New Fairfield, Conn. . .	April 30, 1886.	{ Chenango Co. Med. Soc. Geneva Med. Coll. . .	1843 1861
Lamb, Milton M. . . .	68	Rensselaer .	Verona, N. Y. . . .	April 10, 1892.	Castleton, Vt. . . . .	1856
Lamont, John Campbell	47	Wayne . . .	Edinburgh, Scotland . .	Dec. 13, 1887.	Med. Dep. Univ. City N. Y.	1862
Lauer, Eugene (O)	40	New York . .	Germany . . . . .	Oct. 31, 1886.	Giessen and Marburg . . .	1868
Lester, Sullivan W. (O)	40	Rensselaer .	Niatic, Conn. . . . .	Jan. 5, 1890.	Med. Dep. Univ. City N. Y.	1881
Linsly, Jared (F)	84	New York . .	Northfield, Conn. . . .	July 12, 1887.	Coll. Phys. and Surg., N. Y.	1829
Lyman, E. S. (O)	80	Chenango . .	Torrington, Conn. . . .	Nov. 20, 1892.	Regents Univ. N. Y. . . .	1870
Matthews, David . . . .	60	New York . .	Sullivan County . . . .	July 9, 1891.	Coll. Phys. and Surg., N. Y.	1860
Maury, Rutson . . . . .	27	New York . .	North Carolina . . . .	May 5, 1892.	Bellevue Hosp. Med. Coll.	1887
McClellan, Christopher R.	73	Kings . . .	Maryland . . . . .	Jan. 13, 1887.	University of Maryland . .	1835
McEwen, Robert C. (F)	60	Saratoga . .	Bainbridge, N. Y. . . .	Dec. 26, 1893.	Coll. Phys. and Surg., N. Y.	1856
McTammany, George H.	31	Rensselaer .	Troy, N. Y. . . . .	April 12, 1891.	Albany Medical College . .	1884
McTammany, Wm. F. (O)	36	Rensselaer .	Troy, N. Y. . . . .	July 21, 1888.	Bellevue Hosp. Med. Coll.	1880
Mitchell, Howard E. (F.)	49	Rensselaer .	Hudson, N. Y. . . . .	Aug., 1894.	University of Maryland . .	1882
Moore, Joseph W. (F)	47	Albany . . .	Troy, N. Y. . . . .	Sept. 9, 1896.	Castleton, Vt. . . . .	1859
Morrell, Isaac . . . . .	79	Chemung . .	Cornish, Me. . . . .	Sept. 8, 1887.	Bowdoin Medical College .	1832
Nichols, Henry W. (F)	75	Ontario . .	Whiting, Vt. . . . .	. . . . .	. . . . .	. . . . .
O'Meagher, William . . .	. .	New York . .	. . . . .	Feb. 26, 1896.	University of New York . .	1857
Pask, William (O)	55	Erie . . .	England . . . . .	Aug. 24, 1884.	Med. Dep. Univ. Buffalo . .	1884
Peck, M. R. (O)	62	Warren . . .	Sand Lake, N. Y. . . .	April 4, 1884.	Albany Medical College . .	1851
Perry, Nathaniel M. (O)	77	Steuben . .	Troupsburg, N. Y. . . .	April 3, 1894.	Geneva Med. Coll. . . . .	1845
Pollard, Abiathar . . . .	90	Essex . . .	Bridgewater, Vt. . . .	April 15, 1893.	Castleton, Vt. . . . .	1836

# DECEASED FELLOWS.—*Concluded.*

NAME.	AGE.	COUNTY.	PLACE OF BIRTH.	DATE OF DEATH.	MEDICAL COLLEGE.	YEAR OF GRADUATION.
Pomeroy, Charles G. (F)	71	Wayne	New York	Dec. 14, 1887.	{ Ontario Co. Med. Soc.	1837
Porteous, J. G. (F)	56	Dutchess	Moriah, N. Y.	July 11, 1895.	{ Jefferson Medical Coll.	1850
Pryer, W. Chardavoyne (F)	54	Westchester	New York City	Sept. 24, 1888.	Harvard	1862
Purdy, Isaac (O)	57	Sullivan	Walkill, N. Y.	Dec. 6, 1885.	Coll. Phys. and Surg., N. Y.	1862
Ransom, H. B.		New York			Castleton, Vt.	1851
Reynolds, Rufus C. (F)	79	Monroe	Columbia, Herkimer Co.			
Rice, George	44	Saratoga	Mechanicsville, N. Y.	Dec. 22, 1886.	Fairfield Med. Coll., N. Y.	1830
Ring, William (F)	63	Erie	United States	Jan. 12, 1894.	Albany Med. Coll.	1872
Robinson, Joseph W.	49	Steuben	Angelica, N. Y.	April 20, 1887.	University of Buffalo	1848
Rochester, Thomas F. (F)	63	Erie	Rochester, N. Y.	Jan. 4, 1887.	Buffalo Medical College	1862
Sabin, Robert Hall (F)	56	Albany	Saxton's River, Vt.	May 24, 1887.	University of Pennsylvania	1848
Sayre, Lewis Hall (F)	38	New York	New York City	Dec. 4, 1888.	Albany Medical College	1856
Schoonmaker, E. J. (F)	65	Seneca	Ulster Co., N. Y.	Jan. 2, 1890.	Bellevue Hosp. Med. Coll.	1876
Selden, O. G. (O)		Greene		Aug. 19, 1889.	Geneva Medical College	1848
Skiff, George V. (O)	53	New York	Pike, N. Y.	Jan. 28, 1890.	Univ. City of New York	1860
Slack, Henry (F)	57	Dutchess	Albany, N. Y.	Dec. 10, 1886.	Albany Medical College	1852
Slocum, J. O. (F)	65	Onondaga	Pompey, N. Y.	Mar. 3, 1885.	Castleton, Vt.	1846
Smith, David M.	35	Yates	New York City	Mar. 19, 1891.	Bellevue Hosp. Med. Coll.	1877
Smith, Joseph T. (F)	60	Ontario	Farmington, N. Y.	Dec. 9, 1890.	Jefferson Med. Coll., Phila.	1854
Smith, Marcellus R. (O)	74	Cortland	Taylor, N. Y.	Dec. 11, 1890.	Geneva Medical College	1847
Sprague, William B. (F)	55	Genesee	Pavilion, N. Y.	Mar. 16, 1891.	University of Buffalo	1857



Squire, Truman Hoffman . . . . .	66	Chemung . . . . .	Russia, Herkimer Co. . . . .	Nov. 27, 1889.	Coll. Phys. and Surg., N. Y. . . . .	1848
Steele, Charles G. . . . .	27	Erie . . . . .	Buffalo, N. Y. . . . .	Feb. 12, 1888.	University of Buffalo . . . . .	1886
Steinführer, Gustavus A. (F) . . . . .	37	Schenectady . . . . .	Germany . . . . .	July 2, 1890.	Coll. Phys. and Surg., N. Y. . . . .	1874
Stevens, Frederick P. (O) . . . . .	31	New York . . . . .	Ithaca, N. Y. . . . .	Dec. 4, 1884.	Bellevue Hosp. Med. Coll. . . . .	1877
Stevenson, William G. . . . .	44	Rockland . . . . .	Troy, Ohio . . . . .	Feb. 3, 1888.	Bellevue Hosp. Med. Coll. . . . .	1864
Sutton, George Samuel . . . . .	63	Dutchess . . . . .	Louisville, N. Y. . . . .	Sept. 6, 1888.	Coll. Phys. and Surg., N. Y. . . . .	1859
Taylor, Isaac E. (F) . . . . .	79	New York . . . . .	Philadelphia, Pa. . . . .	Oct. 30, 1889.	University of Pennsylvania . . . . .	1834
Traver, Richard D. (O) . . . . .	56	Rensselaer . . . . .	Half Moon, N. Y. . . . .	May 17, 1895.	Bellevue Hosp. Med. Coll. . . . .	1867
Van Dusen, Melville E. . . . .	36	Steuben . . . . .	Wheeler, N. Y. . . . .	June 15, 1891.	Med. Dep. Univ. Mich. . . . .	1879
VanWyck, R. C. (O) . . . . .	..	Dutchess . . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Vaughn, Frank O. (O) . . . . .	44	Erie . . . . .	Buffalo, N. Y. . . . .	Mar. 18, 1891.	Med. Dep. Buffalo Univ. . . . .	1880
Webb, Edwin (O) . . . . .	85	Queens . . . . .	Devonport, England . . . . .	Jan. 29, 1890.	Coll. Phys. and Surg., N. Y. . . . .	1825
West, M. Calvin . . . . .	58	Oneida . . . . .	Rome, N. Y. . . . .	Oct. 20, 1891.	Michigan University . . . . .	1860
White, Francis V. . . . .	56	New York . . . . .	New York City . . . . .	Oct. 9, 1889.	Univ. City of New York . . . . .	1855
White, William T. (F) . . . . .	64	New York . . . . .	Richmond, Me. . . . .	Sept. 17, 1893.	New York Med. Coll. . . . .	1855
Wieber, George (O) . . . . .	..	Kings . . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Willis, A. B. . . . .	43	Schenectady . . . . .	Coeymans, N. Y. . . . .	May 10, 1891.	Albany Medical College . . . . .	1870
Winship, Cornelius A. (O) . . . . .	62	Rensselaer . . . . .	Litchfield, Conn. . . . .	Feb. 14, 1888.	Albany Medical College . . . . .	1858
Wood, Charles S. (F) . . . . .	65	New York . . . . .	Litchfield, Conn. . . . .	Feb. 1, 1890.	Jefferson Med. Coll., Phila. . . . .	1851
Woodend, William D. (F) . . . . .	61	Suffolk . . . . .	Portsmouth, Va. . . . .	Mar. 8, 1893.	University of Pennsylvania . . . . .	1855
Young, John (O) . . . . .	71	Dutchess . . . . .	Ireland . . . . .	Sept. 2, 1893.	Coll. Phys. and Surg., N. Y. . . . .	1844
Young, Oscar H. (O) . . . . .	43	Delaware . . . . .	Pennsylvania . . . . .	Jan. 21, 1889.	Jefferson Med. Coll. Phila. . . . .	1876

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